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ABSTRACT

One of a series of eleven curriculum manuals which cover the four transportation topics of public transportation, transportation and the environment, transportation safety, and bicycles for elementary, secondary, and adult levels, this manual covers all four topics at the adult level. Materials in four chapters comprising seventeen mini-units present different aspects of the four topics. Each mini-unit consists of a lesson plan component and an individual learning activities component. Some topics deal with buying and maintaining a car, citizen participation to resolve conflicts between transportation and the environment, bicycle buying, and procedures for registering effective complaints about public transit problems. Also included are references for further study resources, suggestions for incorporating the units into a larger adult curriculum, and masters for reproduction of role profiles, game boards, maps, and other distributable materials. (A curriculum guide, CE 014 028, is also available for use with the manuals.) (TA)

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Transportation Consumer Education for Adults

Mini-units and Learning Activities

by

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1977

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FOREWORD

TEACHING TRANSPORTATION: AN OVERVIEW

> Nearly everything Americans do, from mailing a postcard to walking on the moon, depends on transportation. Transportation is essential for the supply of food, clothing and shelter, for national defense and employment, for education and recreation, for the international exchange of goods and services.*

Although every American is provided with the necessities and amenities of modern life through an intricate freight-carrying network, we think of transportation most readily in terms of moving people, not products, and for good reason. Millions of us commute to work every day by car, bus, train, or subway. Moreover, 21 million youngsters travel on school buses every day. Americans use a variety of transportation modes for other purposes, including shopping, recreation, tourism, and moving. The average family changes residence once every five years and makes use of one of the many thousands of for-hire companies that provide domestic surface transportation. In addition, Americans travel more than 1.7 trillion miles by passenger cars or trucks every year, while 250 trains cover 26,000 miles and service 484 communities, with more than seven million people annually using the New York to Washington run alone. There are also 950 intercity bus companies whose 20,600 vehicles travel 1.1 billion miles each year, while commercial aircraft transport over 210 million passengers annually.

Americans are highly dependent on transportation services for recreation purposes, too. Not only are vehicles used to get to places of entertainment, many vehicles are themselves forms of recreation. For example, there are approximately 7.3 million registered boats in the country, not counting rowboats and canoes. Seven and one-half million motor homes, truck campers, and travel and camping trailers are on the roads. Snowmobiles, dune buggies, and home-built vehicles have become widespread in the past few years.

Americans also relax on two-wheeled vehicles: there are 100 million bicycles and nearly five million motorcycles in the country, many of

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*John Burby, *The Great American Motion Sickness* (Little, Brown and Co.: Boston, Massachusetts, 1971), page 3.

which are used for commuting as well as recreation.

The most frequently used form of transportation in the nation, however, is--walking. We sometimes forget that pedestrians utilize the single most common mode of travel.

Finally, the overwhelming importance of transportation in our lives must be assessed not only in terms of movement of goods and people but also in relation to the millions of jobs transportation provides. Transportation facilities and vehicles require manufacturers, builders, operators, and mechanics, while also creating thousands of employment opportunities in related industries, from foundries that produce steel for vehicles to insurance companies that provide automobile insurance to health care systems that treat travel-related injuries.

For all these reasons it is important for citizens to become aware of transportation as it affects their lives, to learn to be wise purchasers and users of transportation goods and services, and to develop skills to promote constructive use and appropriate expansion of all forms of transportation in their communities and beyond.

In particular, consumers should become informed about (1) improving and using public transportation, (2) harmonizing transportation and the environment, (3) understanding transportation safety, and (4) perceiving the importance of bicycling. By examining these four major topics, students will learn, for example, to identify the best methods for commuting to school and work; to travel, when possible, in ways that minimize adverse transportation effects on the environment; and to purchase and use transportation vehicles and facilities in the safest possible manner.

CURRICULUM MATERIALS AVAILABLE

In recognition of both the vast importance of transportation consumption in America and of the need to educate citizens to be wise purchasers and users of transportation goods and services, the U.S. Department of Transportation, Office of Consumer Affairs, contracted with Abt Associates Inc. to develop a series of transportation consumer education curriculum manuals. The following 12 volumes are currently available.

- Travel On! Mini-units and Learning Activities on Transportation for Grades K-3 (Bicycles, Safety, Mass Transit, Environment)
- Travel On! Mini-units and Learning Activities on Transportation for Grades 4-6 (Bicycles, Safety, Mass Transit, Environment)
- Transportation Consumer Education for Adults: Mini-units and Learning Activities (Bicycles, Safety, Mass Transit, Environment)
- Pedal On! Mini-units and Learning Activities on Bicycling for Grades 6-9
- Pedal On! Mini-units and Learning Activities on Bicycling for Grades 9-12
- Ride On! Mini-units and Learning Activities on Public Transportation for Grades 6-9
- Ride On! Mini-units and Learning Activities on Public Transportation for Grades 9-12
- Getting There! Mini-units and Learning Activities on Transportation Safety for Grades 6-9
- Getting There! Mini-units and Learning Activities on Transportation Safety for Grades 9-12
- Transportation and the Environment in Harmony: Mini-units and Learning Activities for Grades 6-9
- Transportation and the Environment in Harmony: Mini-units and Learning Activities for Grades 9-12
- Transportation Consumer Education: A Curriculum Guide for Grades K-12 and Adult

These volumes may be ordered from

Abt Publications
55 Wheeler Street
Cambridge, Massachusetts 02138

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The Federal Highway Administration (FHWA)

The Federal Railway Administration (FRA)

The National Highway Safety Traffic Administration (NHTSA)

The U.S. Office of Education, Bureau of Occupational Education (USOE/BOE)

The U.S. Office of Education, Division of Technology and Environmental Education

The Office of Environmental Affairs in the Department of Transportation

The United States Coast Guard

The Urban Mass Transportation Administration (UMTA)

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Despite the considerable assistance from these sources, only the authors are in any way responsible for errors, approaches, and biases in the final product.

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The complex and time-consuming tasks of typing, proofing, and preparing the manuscript for publication were coordinated by Judy Sobel with complete competence and exemplary patience.

GOVERNMENT INFORMATION AGENCIES

For further information about transportation issues, contact the appropriate agencies within the U.S. Department of Transportation or other government agencies or commissions listed below:

Agency Name and Address	Telephone Number
U.S. Department of Transportation Office of Public Affairs 400 7th Street, S.W. Washington, D. C. 20590	202/426-4321
Office of the Secretary of Transportation Office of Consumer Affairs (address above)	202/426-4520
National Highway Traffic Safety Administration Office of Consumer and Public Affairs (address above)	202/426-0670
Federal Highway Administration Office of Public Affairs (address above)	202/426-0648
United States Coast Guard Office of Public Affairs (address above)	202/426-1587
Urban Mass Transportation Administration Office of Public Affairs (address above)	202/426-4043
Federal Railroad Administration Office of Public Affairs (address above)	202/426-0881
Federal Aviation Administration Office of Public Affairs U.S. Department of Transportation 800 Independence Avenue, S.W. Washington, D. C. 20591	202/426-3883
Interstate Commerce Commission Constitution Avenue and 12th Street, N.W. Washington, D. C. 20423	202/343-4761 (consumer phone)

Agency Name and Address	Telephone Number
Federal Trade Commission Bureau of Consumer Protection Pennsylvania Avenue and 6th Street, N.W. Washington, D. C. 20580	202/962-2358
Environmental Protection Agency 401 M Street, S.W. Washington, D. C. 20460	202/755-0890

INTRODUCTION

WHAT'S IN THE MANUAL

This Manual is divided into *four chapters*, each one treating a different transportation topic. The four chapters focus on

1. Public transportation
2. Transportation and the environment
3. Transportation safety
4. Bicycles

Within each chapter are mini-units which treat different aspects of the chapter topic. Each mini-unit consists of two components:

1. A *lesson plan* provides a suggested sequence of learning activities.
2. *Individual learning activities* describe in detail how to implement the exercises in the lesson plan.

Included at the end of each chapter is a Bibliography of suggested teacher and student materials.

Nine spirit masters are provided at the end of the Manual for use with a number of activities.

HOW TO USE THE MANUAL

This Manual is designed as a resource volume of activities and background materials to be used in ways compatible with your needs and those of your students.

The mini-units and individual learning activities may be integrated into your curriculum at many points and to meet many purposes. They can be appropriately used by consumer education instructors and by leaders of community action groups. They can also be very effectively integrated into courses on environmental studies, economics, current affairs, and community issues.

You will find that the introduction to each chapter sums up the rationale for teaching that topic. After reading these four introductions, you will have the background for deciding which chapter or chapters you will teach. In examining the mini-units in a given chapter, you should feel free to make substitutions or deletions in the mini-units and in the learning activities whenever this is necessary to meet your teaching objectives.*

Here are several methods for adapting the mini-units and learning activities to teach transportation.

You can read through the lesson plans for each mini-unit in a particular chapter and *select one or more mini-units* to integrate into your courses. Having made your selection, read the detailed activity

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*Some activities that involve comparisons between different modes of transportation (for example, buses versus subways, cars versus buses) may appear usable only in communities in which there are other forms of transportation beside the automobile. However, students in such communities can still conduct most of these activities by *imagining* that their town has at least two modes of transportation or by conducting the activity as if they lived in a community which provides several transportation modes.

Students need to study different transportation modes even if their own communities have no public transportation or provide only one or two modes because a general knowledge of every aspect of transportation is important to all citizens in a highly technological and mobile society such as ours. On a more practical level, students may be able to benefit concretely from a study of different transportation modes if they some day move to communities where multiple modes are available or vote for state or national candidates who have taken a stand on transportation issues or vote on referenda relating to transportation financing.

descriptions which follow the lesson plans for specific instructions on implementing the activities in the mini-unit or units you have chosen. This method of using the Manual is most appropriate if you wish to concentrate in some depth on one or more specific aspects of transportation.

You can also *develop your own mini-unit* consisting of from one to several individual activities. If you wish to do this, read the capsule descriptions of each activity, which appear on the first page of each chapter, and pull from the various mini-units those activities you would like to use. (The activities are numbered consecutively throughout the Manual from 1 to 62 regardless of chapter topic. Likewise, the mini-units are numbered consecutively from 1 to 17.)

You can extract one or more of the individual activities from the Manual and *integrate them at appropriate points into your existing course.*

You can *implement one or more of the activities on an informal basis* in response to concerns or interests your students express spontaneously about various transportation topics--the "teachable moments" approach.

PUBLIC TRANSPORTATION

PUBLIC TRANSPORTATION: AN OVERVIEW

The Problem

The mobility and convenience of the automobile have created an enormous imbalance in our transportation modes and a neglect of public transportation. Patronage of public transportation services (buses, trolleys, subways, and trains) declined from 23 billion in 1945 to 6.95 billion in 1975--a decrease of 67 percent, while the number of motor vehicles increased from 31 million in 1945 to 133.7 million in 1975--an increase of over 300 percent. Of the 133.7 million vehicles in 1975, 107.3 million were passenger cars.

American consumers are the purchasers and users of nearly $124 billion per year worth of personal transportation goods and services. Of these consumers, 28 million are students who use public and private transportation every day to get to school and untold millions are people who commute to work every day.

A shift in emphasis from automobiles to public transportation is essential to provide a means of transportation for the one in five families living in cities and one in four families living in small towns who do not own a car; for the people who do own cars but who are on countless occasions unable to use them due to personal incapacities, loss of license, loan of the car, or repairs; and for the elderly and the permanently handicapped who cannot drive. Such a shift in emphasis would also improve the quality of the environment by decreasing the level of air, noise, and visual pollution since, even with improvements in the control of auto emissions, the motor vehicle is still a major pollutant of our environment, particularly in congested cities. It would eliminate massive traffic congestion: 77 percent of the nation's work force commutes to work every day by private automobile; 70 percent of these people drive alone; 32 urban areas account for 37 percent of all motor vehicles, contributing to heavy traffic congestion. Greater use of public transportation would reduce auto-related accident fatalities, which have killed more people on our nation's highways than the total number of Americans killed in wars fought by this country. Finally, it would reduce the energy consumption of motor vehicles by 25 percent--18 percent of the nation's energy is consumed by motor vehicle transportation, of which nearly 80 percent is for personal travel by car, truck, or bus; although Americans reduced their vehicle fuel consumption in 1974 and 1975 as a result of the immediate fuel crisis, early 1976 patterns indicate an increase in vehicle fuel consumption.

The Solutions

Solutions to these problems depend on Federal and state governments, which must promote balanced transportation by providing assistance for planning, development, and financing of improved transportation systems and enact legislation of assistance to the public transportation area. They depend on local transit authorities, who must generate greater use of their services by making public transportation more accessible and attractive to the daily traveler while finding solutions to their severe financial problems. They depend on citizens/consumers, who must become informed of local transportation problems, participate in their remedies, and take advantage of available public transportation services. Finally, solutions depend on *teachers*, who must guide learners to a better understanding of the causes and effects of transportation problems, and of possible solutions. Transportation consumer education can offer the learner a unique opportunity to develop awareness and skills essential to acquire responsible transportation habits and to play a role in supporting and improving transportation in the community.

This chapter focuses on teaching public transportation by developing consumer skills that are particularly appropriate to adults. The learning activities are designed to

- Stimulate students to include considerations of energy conservation and pollution prevention as well as the more familiar criteria of cost, comfort, safety, and speed when deciding how to travel to a given destination

- Make students aware of the severe imbalance currently existing between overuse of automobiles and underutilization of public transportation and what effects this imbalance has had and is having on the environment and opportunities for efficient, inexpensive, and safe travel

- Teach students how public transportation is financed, why most public transportation systems suffer from a chronic lack of operating funds, and what recent moves have been made to provide additional funding

- Develop awareness in students of how public transportation fails in many communities to meet the needs of both the general public and also specific groups with travel handicaps, including children, the elderly, the handicapped, and rural dwellers

- Promote understanding of who is responsible for changes in public transportation, how changes might be effected, and what the difficulties are in trying to improve public transportation service

- Provide students with the knowledge, skills, and motivation to effectively seek redress of grievances for unsatisfactory public transportation service

MINI-UNITS AND ACTIVITIES

Activity #	*Activity Description*	*Class Time (periods)*
	Mini-unit 1 Learning to make choices among different transportation modes	
1	Students learn the nature of the field of public transportation and the advantages and disadvantages of using public transportation in general and in their own community in particular.	1-3
2	Students research the effects of automobiles on the environment and compare these effects in their own and other communities with those of public transportation vehicles.	1-3
3	Students analyze America's alleged love affair with the automobile and its impact on public transportation.	1-2
	Mini-unit 2 Evaluating public transportation financing	
4	The class identifies and evaluates funding actions being taken by the Federal government to improve and promote public transportation in America.	1-2
5	Students investigate the cost of public transportation in their community and then discuss how transit authorities and government agencies do and should allocate their funds.	2-3
6	Students debate the cost benefits of different forms of public transportation and of improvement in existing public transportation service.	1-3
7	Students role-play legislators deciding what public transportation improvements or expansion to finance in their community.	1-2
8	Students analyze the extent to which public transportation should be subsidized by the government.	1-2
	Mini-unit 3 Public transportation: what are the problems?	
9	Students research the ways in which public transportation meets and fails to meet the needs of the community.	3-5
10	Students investigate why public transportation service in many communities is inadequate.	2-4
11	Students learn how greater use of public transportation can be stimulated by regulating the commuting behvaior of the public.	1-2
	Mini-unit 4 Who can effect improvement of public transportation	
12	Students research the structure, powers and decision-making process of public transportation authorities.	2-3
13	Students learn how to seek redress of grievances against unsatisfactory public transportation service.	2-4
14	Students interview public transportation system employees and administrators to learn what constraints may make it difficult to impossible to improve service.	1-2
15	Students research methods of citizen action designed to promote public transportation.	2-3

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 1

LEARNING TO MAKE CHOICES AMONG DIFFERENT TRANSPORTATION MODES

This first mini-unit is designed as an introduction to public transportation. It asks students to define the concept of public transportation and then identify and discuss the major aspects and problems associated with the field. It is also intended to help students develop skills in selecting the best way to travel in their communities from among both private and public transportation modes. Particular attention is given in the unit to the tremendous reliance many people place on the automobile for most of their travel needs and to whether such reliance is excessive and could be reduced by increased patronage of public transportation.

Close attention is also given in the unit to how automobile users can make more efficient use of the automobile through carpooling and trip consolidation.

Since many of the pupils who study this mini-unit may be automobile drivers as well as users of public transportation, students can engage in the activities with their own personal behaviors and feelings in mind--as commuters to jobs, taxpayers, family budgeters, and purchasers and users of a host of transportation goods and services.

Specific concepts addressed in the unit include the following:

- Selecting the best method of travel requires identifying and weighing the advantages and disadvantages of different transportation modes.
- The harmful and beneficial effects on the environment of different transportation modes should be identified and considered in deciding how to travel.
- Consumers need to evaluate the appropriateness of using automobiles to satisfy emotional needs in light of the harmful effects on the environment excessive automobile use causes and the imbalance in the use of transportation modes that it creates.
- A major advantage in using public transportation is that such patronage helps attain a balance in the use of all transportation modes.
- Carpooling reduces the harmful effects of excessive automobile use on the environment and helps conserve energy resources.

MINI-UNIT 1 LESSON PLAN

Learning to make choices among different transportation modes

Activity #	*Activities*	*Class Time*
1 Spirit Master #1	DESCRIPTION: Students learn the nature of the field of public transportation and the advantages and disadvantages of using public transportation in general and in their community in particular. GOAL: To understand the expression "public transportation" and what is involved in using public transportation.	1-3 periods
2	DESCRIPTION: Students research the effects of automobiles on the environment and compare these effects in their own and other communities with those of public transportation vehicles. GOAL: To be able to compare and evaluate the environmental effects of public transportation and automobiles.	1-3 periods plus out-of-class time
3	DESCRIPTION: Students analyze America's alleged love affair with the automobile and its impact on public transportation. GOAL: To be aware of the many reasons people drive cars, of the impact excessive automobile use has on public transportation, and of how to use the automobile more efficiently.	1-2 periods

Total Class Time: 3-11 periods

ACTIVITY #1

Mini-unit Topic: Making Choices Among Modes

Approximate Class Time: 1-3 periods

Capsule Activity Description: Students learn the nature of the field of public transportation and the advantages and disadvantages of using public transportation in general and in their community in particular.

Goal:

To understand the expression "public transportation" and what is involved in using public transportation.

Concepts Treated:

- Public transportation refers to particular types of travel whose nature can be specifically described.
- Citizens need to learn about many different aspects of public transportation if they are to use it effectively.
- Selecting the best method of travel requires identifying and weighing the advantages of different transportation modes.
- A major advantage in using public transportation is that such patronage helps attain a balance in the use of all transportation modes.
- The harmful and beneficial effects of different transportation modes on the environment should be identified and weighed in deciding how to travel.
- Carpooling reduces the harmful effects of excessive automobile use on the environment and helps conserve energy resources.

ACTIVITY

Part One: The Nature of Public Transportation

Begin the activity by asking students for *their* definition of public transportation and then revising it for the purposes of the particular mini-units which will be studied. The broadest definition consistent with all the activities in the Manual is

> Public transportation refers to all modes of travel operating within a community (as opposed to between states, etc.) that involve publicly owned vehicles (for example, vehicles owned by the government) or vehicles owned by private businesses (for example, a taxi company), as opposed to vehicles owned by private citizens, including automobiles, bicycles, and recreational vehicles. Public transportation also includes the facilities (for example, bus stop shelters and ferry docks) serving public transportation vehicles and their passengers.

Having defined the field of study, the class then identifies the major aspects of public transportation that can usefully be studied *from the perspective of the transportation user (consumer)*. Supplement the students' catalog of topics worth studying with the items in the following list (all of which are treated in one or more of the following mini-units).

What are the public transportation modes and facilities available in America and in our community?

1. What are the modes? bus? train? subway? taxi? ferry? light rail (trolleys)? carpooling? Other (such as demand-responsive, cable cars, aerial tramways)?

2. How can we learn what services are available?

3. Why doesn't our community have some of these modes?

4. Has ridership increased, declined, or remained constant over the past decades? Have there been corresponding changes in the availability of public transportation services? (The use of public transportation decreased from a high of 23.2 billion passengers in 1945 to 6.56 billion in 1972. During this time, the number of passenger vehicle miles declined from 3.2 billion to 1.7 billion. Since 1972, the use of public transportation and the number of passenger vehicle miles have increased gradually. In 1975, it is estimated that there were 6.95 billion passenger trips on public transportation and the number of passenger vehicle miles reached nearly two billion. You might ask students to research whether these trends are consistent with public transportation in your area. (See also the first chart at the end of this activity.)

5. If our community has only one mode of public transportation, is it sufficient? If not, how should it be expanded? Or should another mode be installed, rather than expanding the present mode? If our community has no public transportation, does it need some?

6. What plans are underway for the provision of public transportation in the future? If no plans exist, what modes does the class think are needed? Why? (See Activity #4 for examples of government plans in the field of public transportation.)

How can and should people decide when to use public transportation and which modes of public transportation to use? To what extent does the decision depend on

1. Knowledge of public transportation?

2. Availability of public transportation?

3. Convenience, speed, cost, safety, and comfort?

4. Familiarity with the operations of public transportation?

5. Feelings about public transportation and automobiles, such as inappropriate fears of getting lost and strong desires to use a fast or glamorous automobile?

6. Concerns about the social, environmental, and energy-depleting effects of excessive reliance on automobiles and concerns about attaining a balance in the use of transportation modes?

How does one go about using public transportation? What actions can citizens take to improve public transportation or have it installed if it does not exist?

1. Is it important for citizens to become involved in decisions involving public transportation? Why or why not?

2. What types of actions can citizens take to improve public transportation services? Possibilities include persuading friends and family to use them more often or more appropriately, participating in transportation planning, engaging in political action such as voting and petitioning public officials, seeking redress of grievances, and initiating carpooling.

3. How can citizens also promote more efficient use of the automobile?

4. About what public transportation issues can and should citizens become involved--for example, how important is safety? availability of services? discriminatory services? funding problems? fares? environmental considerations?

5. What actions can citizens take to meet the grievances operators of public transportation have against citizens, such as vandalism and discourtesy?

Part Two: The Advantages and Disadvantages of Public Transportation*

Duplicate copies of the check sheet provided in Spirit Master #1, and distribute two copies to each student. Each student fills in one, placing check marks in the boxes to indicate good features they feel different modes of public transportation offer *in general*, without special reference to their community. For example, taxis in general offer a fair amount of privacy; subways use energy relatively efficiently. Students then think of *their own community* and place check marks in the boxes of the second chart to indicate good and bad features they feel different modes of public transportation display in their community.

In communities with only one mode (or no public transportation), students should consider what *would* be the pros and cons of various modes that might be installed in their community and why there is only one mode or no public transportation available.

The class then breaks into small groups. Each group compares its members' sheets and discusses discrepancies among them until it is able to develop (using two more blank sheets) a consensus on the positive and negative features of public transportation (1) in general and (2) in the local community.

Each group presents its results to the class and the opinions of all the groups are compared. Disagreements among groups are discussed and explained. Follow-up discussion is held to consider which of the seven (or more, if students added to the list) general features of public transportation are most important and why--that is, which of these features would be most likely to motivate a citizen to use public transportation instead of a car or use one particular mode of public transportation instead of another. The features can be rank ordered from most influential to least important.

Be sure to point out that one of the major needs in most American communities today is to achieve a balance in the use of all transportation modes. To the extent that people increase their use of public transportation and rely less on the use of automobiles they will be contributing to the attainment of a balanced transportation system in their community.

Part Three: Carpooling

You should also point out that as a supplement to creating a balanced transportation system by increasing their use of public transportation, the public can also make more efficient use of the automobile by consolidating trips and participating in carpools.

The class can discuss whether it feels carpooling can be considered a form of public transportation and then move on to discuss the advantages and disadvantages of carpools. You can raise for consideration the following points:

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*See also the first Variation and Supplementary Activity at the end of this activity.

Advantages

- Reduces traffic congestion and air pollution
- Conserves energy resources
- Promotes sociability
- Reduces need for street maintenance
- Saves participants money (see cost-savings chart at the end of this activity)
- May save participants frustration associated with driving daily in traffic or long distances
- Particularly practical in areas in which public transportation is not readily available

Disadvantages

- Loss of privacy
- Loss of flexibility in times of departure and arrival
- May involve increased time commuting in order to pick up other passengers
- May involve frustration of waiting for late passengers or embarrassment at leaving them behind
- May involve phone calls in cases of illness or other times when passenger or driver can't make the trip
- May involve discomfort of traveling with uncongenial passengers
- May prevent running errands during lunch hour

After discussing pros and cons of carpooling (and students should be encouraged to describe personal carpooling experiences), class then discusses one or more of the following issues:

1. Should businesses provide special arrangements to facilitate the formation of carpools (e.g., maps indicating where employees live)? Do any students work for companies that do?
2. Should businesses provide incentives for employees to form carpools or disincentives against employee use of automobiles to commute to work?

3. Should the government assist in the formation of carpools (e.g., by providing computer services), institute special benefits for carpools (e.g., special lanes on crowded highways during rush hour, reduced tolls on bridges), or engage in a media campaign to promote the use of carpools?

4. Should employees actively encourage each other to join carpools? Have any students done so where they work?

Conclude the activity by inviting an official of a local public transportation system to come to class (preferably on a bus) to react to and expand on the students' conclusions regarding the good and bad features of using public transportation.

Evaluation Method:

Students take trips using different public transportation modes (including carpooling) and assess each mode's desirability, identifying its advantages and drawbacks.

Variations and Supplementary Activities:

Class can break into small groups, with each group responsible for developing its own definition of public transportation and identifying its own list of topics that can be considered to fall within the field of public transportation education.

Students can interview public transportation officials in their community about what they think the components of the field are and how they define public transportation. Students compare the officials' definitions with their own and resolve any discrepancies. A public transportation official can also be invited to class to discuss these issues.

The second part of this activity can be simplified or made more complex in a number of ways. For example, students can fill in one chart as a class, considering only their own community's public transportation facilities. Students can also refine the sublistings under each of the seven features to include time of day travel occurs, type of person doing the traveling (e.g., handicapped? child?), weather condition, or comparisons with walking or bicycling as alternative modes of travel. For example, taking a ferry may be relatively more expensive for the poor than for the middle class. Using a taxi may be less convenient for minority persons who are sometimes refused rides than for whites who are routinely picked up. Taxis may be more comfortable to use in cold, heat, rain, or snow than buses for which one may have to stand outdoors awaiting their arrival. On the other hand, taxis are expensive. Buses may not run frequently after 8:00 P.M.

Students can adapt the chart into a questionnaire and poll the community to learn its attitudes toward the advantages and disadvantages of using public transportation.

Students can insert private modes of transportation at the top of the chart and draw comparisons between them and different forms of public transportation. See example below:

	Bus	*Train*	*Subway*	*Taxi*	*Light Rail (Trolley)*	*Ferry*	*Automobile*	*Walking*	*Bicycle*	*Motorcycle*	*Carpool*

Students in a community without public transportation or with only one mode can pick a community about which they have some information (e.g., the nearest big city) and which is different from their own community in terms of size and types of public transportation available and complete the chart for that community. Students compare and discuss results.

Students can compare the economic costs of commuting to work by public transportation as opposed to by car. The table on the following page was compiled in July, 1975 by the Highway Users Federation, and provides average costs for a ten-mile home-to-business trip (which will vary from community to community).

ECONOMIC COST OF ONE-WAY URBAN COMMUTER TRIPS - COMBINED MODES

Urban areas greater than 1,000,000 population, 1975

	Economic Cost Per Person[a] *5 to 20 Mile Trips*				
Travel Mode	*5 Mile*	*10 Mile*	*15 Mile*	*20 Mile*	Route
Automobile - one occupant	$2.53	$3.71	$4.90	$6.08	*b*
Rail transit, kiss-and-ride access[a]	1.64	3.29	4.93	6.57	*c*
Busway, kiss-and-ride access[a]	1.48	2.95	4.43	5.90	*d*
Rail transit, walk access	1.37	2.73	4.09	5.46	*e*
Automobile - 1.4 average occupancy	1.81	2.65	3.50	4.34	*b*
Rail transit, park-and-ride access	1.42	2.62	3.75	4.91	*e*
Busway, park-and-ride access	1.26	2.28	3.24	4.24	*d*
Rail transit, bus access	1.12	2.25	3.37	4.49	*c*
Busway, bus access	0.96	1.91	2.87	3.83	*d*
Automobile - two occupants	1.26	1.86	2.45	3.04	*b*
Bus - conventional	0.88	1.76	2.64	3.52	*f*
Automobile - three occupants	0.84	1.24	1.63	2.03	*b*
Automobile - four occupants	0.63	0.93	1.22	1.52	*b*
Automobile - six occupants	0.42	0.62	0.82	1.01	*b*
Van - eight occupants	0.36	0.54	0.73	0.92	*b*

Note: Modes are listed in rank order according to the costs for ten-mile trip.

[a] Automobile and driver make round trip to rail station.

[b] Half on arterial streets, half on freeways.

[c] Half on arterial streets, half on rail.

[d] Half on arterial streets, half on busway.

[e] All rail.

[f] All arterial streets.

Students can develop questionnaires and administer them to other community members, asking about their attitudes toward carpools and whether they are in one, would like to join one, or are opposed to them.

Students can research the results of carpool experiments in businesses by interviewing employers and employees who have set them up.

Students can research incentives local governments have used to promote the use of carpools; for example, the provision of a special lane and reduced toll on the San Francisco-Oakland Bay Bridge in California.

Students can compare carpools with taxis and discuss whether taxis should be allowed to carry several passengers who are going to different destinations.

Students can discuss whether free transportation provided by churches and community agencies for the elderly and handicapped or vans provided by companies as a shuttle service between plants should be considered "public transportation" and why.

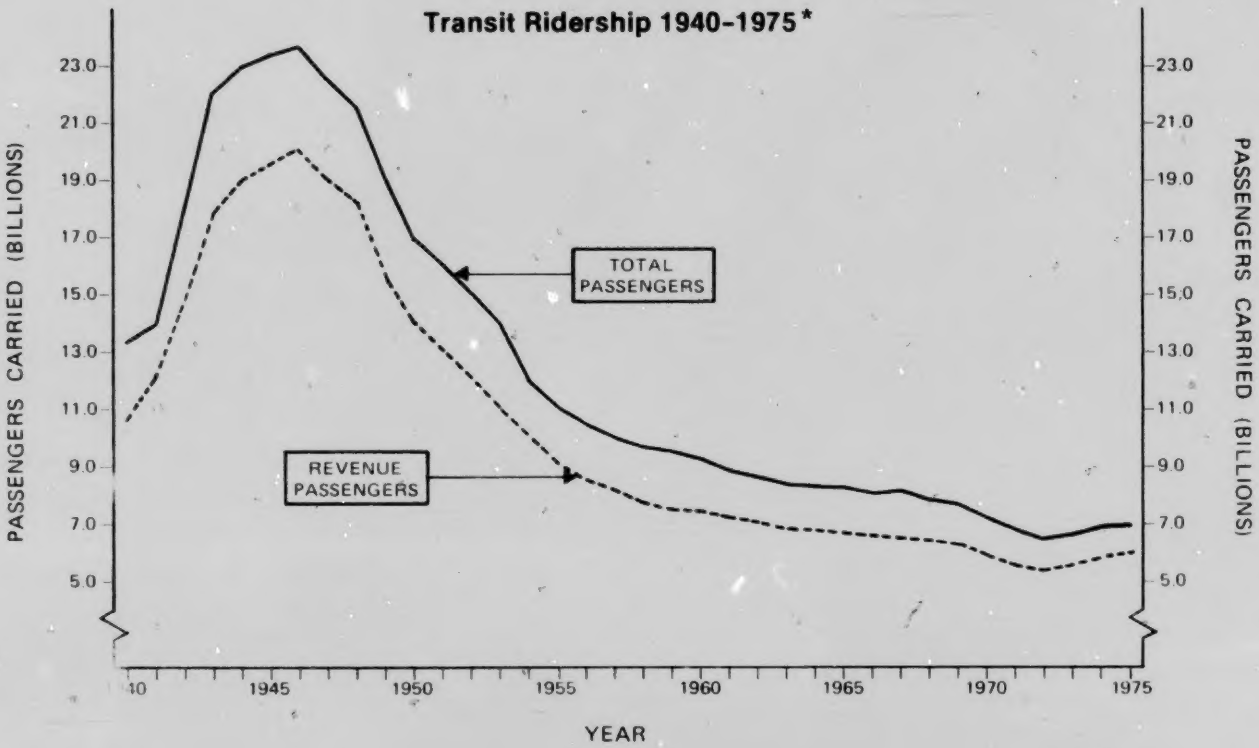


*Chart taken from *Transit Fact Book*, courtesy of the American Public Transit Association, Washington, D.C.

CARPOOL SAVINGS

SEE HOW MUCH MONEY YOU CAN SAVE IN ONE YEAR BY CARPOOLING

FEDERAL HIGHWAY ADMINISTRATION

HOME TO WORK	ANNUAL ROUND TRIP COSTS AND SAVINGS	SUBCOMPACT (PINTO, DATSUN, VEGA, VW, COLT)	COMPACT (NOVA, DART, MAVERICK, PACER)	STANDARD (MATADOR, CUTLASS, LTD,CAPRICE)
10 MILES (20 MILES ROUND TRIP)	**COST OF DRIVING TO WORK ALONE**			
	GASOLINE AND OIL	$128	$176	$234
	MAINTENANCE AND REPAIR	97	109	130
	PARKING	145	145	145
	INSURANCE	166	176	189
	DEPRECIATION	110	143	250
	TOTAL	$646	$749	$948
	SAVINGS PER PERSON IN A:			
	2-PERSON CARPOOL	$281	$332	$427
	3-PERSON CARPOOL	361	427	553
	4-PERSON CARPOOL	402	474	617
	5-PERSON CARPOOL	425	502	654
15 MILES (30 MILES ROUND TRIP)	**COST OF DRIVING TO WORK ALONE**			
	GASOLINE AND OIL	$193	$264	$352
	MAINTENANCE AND REPAIR	145	164	195
	PARKING	145	145	145
	INSURANCE	166	176	189
	DEPRECIATION	166	215	374
	TOTAL	$815	$964	$1,255
	SAVINGS PER PERSON IN A:			
	2-PERSON CARPOOL	$366	$438	$581
	3-PERSON CARPOOL	473	569	758
	4-PERSON CARPOOL	528	635	847
	5-PERSON CARPOOL	559	674	899
20 MILES (40 MILES ROUND TRIP)	**COST OF DRIVING TO WORK ALONE**			
	GASOLINE AND OIL	$257	$352	$468
	MAINTENANCE AND REPAIR	193	218	260
	PARKING	145	145	145
	INSURANCE	166	176	189
	DEPRECIATION	221	286	499
	TOTAL	$982	$1,177	$1,561
	SAVINGS PER PERSON IN A:			
	2-PERSON CARPOOL	$449	$545	$734
	3-PERSON CARPOOL	585	712	963
	4-PERSON CARPOOL	654	796	1,077
	5-PERSON CARPOOL	693	845	1,145

EXAMPLES OF SAVINGS

A PINTO DRIVER AND A LTD DRIVER, WHO ARE NEIGHBORS, DECIDE TO COMMUTE TOGETHER TO WORK. THE TRIP IS 10 MILES EACH WAY SO THE ANNUAL SAVINGS FOR THE PINTO DRIVER IS $281 FOR THE 20 MILE ROUND TRIP. FOR THE LTD DRIVER IT IS $427, OR A CARPOOL TOTAL OF $708 SAVINGS BETWEEN THE TWO OF THEM.

FIVE STANDARD CAR DRIVERS IN A SMALL TOWN FORM A CARPOOL TO COMMUTE THE 20 MILES TO THE CITY TO WORK (40 MILES ROUND TRIP) WHICH GIVES EACH OF THEM AN ANNUAL SAVINGS OF $1,145 OR A TOTAL FOR THEIR CARPOOL OF $5,725.

ACTIVITY #2

Mini-unit Topic: Making Choices Among Modes

Approximate Class Time: 1-3 periods, plus out-of-class time

Capsule Activity Description: Students research the effects of automobiles on the environment and compare these effects in their own and other communities with those of public transportation vehicles.

Goal:

To be able to compare and evaluate the environmental effects of public transportation and automobiles.

Concepts Treated:

- All forms of transportation have environmental effects.
- The effects of transportation vehicles on the environment can be neutral or harmful.
- The harmful and beneficial effects on the environment of different transportation modes should be identified and considered in deciding how to travel.

ACTIVITY

One of the arguments for using public transportation and decreasing use, where appropriate, of automobile travel is that automobiles have more adverse effects on the environment than do buses, trains, ferries, and subways per number of persons transported by each vehicle. In order to confirm the validity of this argument, students in small groups, individually or as a class, research the effects of automobiles on the environment in terms of noise pollution; air pollution; traffic congestion; influence on residential and work patterns; creation of a need for facilities, such as highways and parking lots, which take up land and may displace homeowners, apartment dwellers, and businesses; and energy consumption.

Students select research methods which are most appropriate to the availability of resources in their community. Examples of research methods follow:

Students can *survey* their neighborhood to determine the extent to which facilities servicing automobiles take up land in the community and whether this land could profitably be put to other purposes. Students can then compare the extent to which public transportation facilities also consume valuable land space (or, if the community has no public transportation, imagine how much space would be taken if the community did have at least one mode of public transportation). Students should also be made aware that one out of six jobs throughout the country stems from transportation and consider how many jobs the automobile in particular provides in their community and throughout the nation compared with the number provided by public transportation systems.

Students can *research* the effects of highway and road construction on the displacement of persons, businesses, farms, and community facilities by interviewing officials of businesses or agencies responsible for the displacement and officials in agencies responsible for helping displaced persons and businesses. Students can compare the effects of highway displacement with the effects of displacement due to construction of public transportation facilities.

Students can *investigate* the effects of automobiles and of the facilities servicing cars on the appearance of the environment (for example, litter, billboards, junkyards) and compare these visual effects with those which result (or would result) from public transportation.

Students can *place themselves in areas* in which there are public transportation vehicles and compare the noise levels they produce with those produced by automobiles on limited access highways and busy streets.

Students can *compare* the effects on workers of commuting by car with those of commuting by public transportation in terms of emotional benefits and costs.

Students can also *compare* the effects on workers of commuting by single-occupancy cars with those of commuting in carpools in terms of emotional benefits and costs and impact on the environment.

Students can *read* appropriate literature on the environmental effects of the automobile and various forms of public transportation, such as the materials suggested in the Bibliography at the end of this chapter.

Students can *interview* government agency officials in departments of transportation, highways, public transportation, and environmental protection on what effects automobiles and public transportation vehicles have on the environment.

Students can *keep a detailed written list* of their observations of transportation effects on the environment for a given period of time, such as one day, two days, or a week. Different students can pick different vehicles, including cars and buses. Students can compare the effects on the environment they observed caused by automobiles with those produced by public transportation vehicles.

Students can *research* the comparative beneficial effects automobiles, as opposed to public transportation vehicles, have on the quality of life, such as providing access to parks, historical sites, or other natural areas; relieving traffic from more congested parts of town; and providing scenic views.

Students can *investigate* the extent to which automobiles consume scarce energy resources as compared with public transportation vehicles by interviewing appropriate government and transportation authority officials and by making rough mathematical computations of their own. (See the two charts at the end of this activity for statistics on energy consumption by different transportation modes.) In addition, students can examine the following statistics and relate them to their own community:

- Approximately 60 percent of the liquid fuel consumed in the United States is used for transportation purposes.
- Within the transportation sector, highway vehicles are the major consumer, accounting for nearly 40 percent of all petroleum used in the United States.
- Transportation's petroleum requirements doubled between 1954 and 1974.
- Ninety-two percent of the more than 2.4 trillion "person miles" of travel annually in the United States are by automobile.
- Seventy percent of all travel in the United States is by automobile, 27.6 percent by commercial air transportation, 1.5 percent by bus, and 0.5 percent by passenger rail.

1974 GASOLINE CONSUMPTION

Vehicles		*Barrels/Day*
Passenger cars		
Getting to work		1,760,000
Pleasure driving		1,360,000
Personal business		1,020,000
Business, government		800,000
	Subtotal	4,940,000
Trucks		1,470,000
Farm vehicles		200,000
Other uses		200,000
	Total	6,810,000

After engaging in one or more of these research activities, students compare the relative positive and negative effects on the environment of automobiles and public transportation vehicles *in terms of the number of people they transport*. The class should be aware that there are, of course, many other factors that must be considered in assessing the relative merits of public transportation as opposed to the automobile, including economic costs, convenience, safety, and speed. In particular, students should consider the number of jobs the use of automobiles makes available to Americans and what effects decreased use of cars might have on employment opportunities. Would a relative increase in patronage of public transportation make up for loss of jobs stemming from decreased use of the automobile?

Evaluation Method:

Students research the comparative effects of public transportation and automobiles in their own community.

Variation and Supplementary Activity:

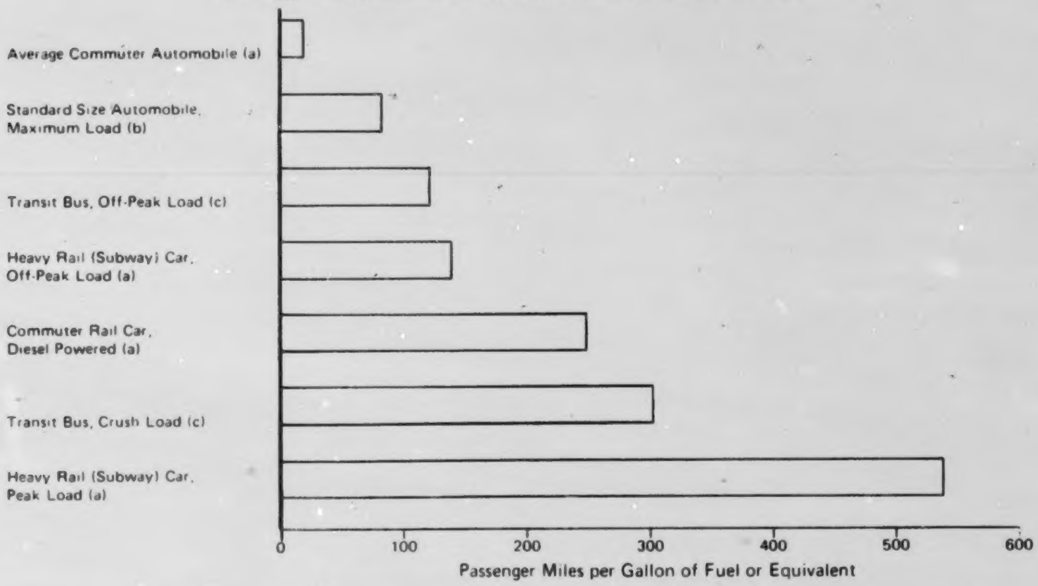
Students debate one or more topics comparing the relative effects on the environment of automobiles as opposed to public transportation vehicles, such as, "Resolved, that an extension of the bus service between Grant and Lee Streets would be of greater benefit to the environment than widening Appomatox Street to accommodate more cars."

Energy Requirements of Passenger Transportation Modes *

	ASSUMED PASSENGER LOADING	VEHICLE MILES PER GALLON OF FUEL OR EQUIVALENT	PASSENGER MILES PER GALLON OF FUEL OR EQUIVALENT
Heavy Rail Transit (Subway) Car Peak Load (a)	135	4.00	540
Intercity Passenger Train (b)	540-720	0.50	270-360
Transit Bus, Peak Load (c)	75	4.10	307
Intercity Bus (d)	47	6.00	282
Commuter Rail Car, Diesel Powered (a)	125	2.00	250
Heavy Rail Transit (Subway) Car, Off-Peak Load (a)	35	4.00	140
Transit Bus, Off-Peak Load (c)	30	4.10	123
Rail Turbine Train (b)	320	0.33	110
Standard Size Automobile, Intercity, Maximum Load (e)	6	18.00	108
Standard Size Automobile, Urban, Maximum Load (e)	6	14.40	86
Wide-Body Commercial Jet Aircraft, 1,000 Mile Flight (f)	256-385	0.14-0.22	54-60
Twin Jet Commercial Aircraft, 500 Mile Flight (f)	68-106	0.44-0.54	37-47
Average Commuter Automobile (a)	1.4	13.5	19

Sources
(a) Commonwealth of Pennsylvania, Department of Transportation
(b) National Railroad Passenger Corporation (Amtrak)
(c) Cleveland Transit System
(d) U.S. Department of Transportation, Transportation Systems Center
(e) U.S. Department of Transportation, Federal Highway Administration
(f) National Aeronautics and Space Administration

Energy Comparison of Urban Transportation Modes



Sources (a) Commonwealth of Pennsylvania, Department of Transportation
(b) U.S. Department of Transportation, Federal Highway Administration
(c) Cleveland Transit System

*Chart taken from *Transit Fact Book*, courtesy of the American Public Transit Association, Washington, D.C.

ACTIVITY #3

Mini-unit Topic: Making Choices Among Modes

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students analyze America's alleged love affair with the automobile and its impact on public transportation.

Goal:

To be aware of the many reasons people drive cars, of the impact excessive automobile use has on public transportation, and of how to use the automobile more efficiently.

Concepts Treated:

- Many people have emotional as well as practical reasons for driving cars.
- The harmful and beneficial effects of different transportation modes on the environment should be identified and considered in deciding how to travel.
- Consumers need to evaluate the appropriateness of using automobiles to satisfy emotional needs in light of the harmful effects on the environment excessive automobile use causes and the imbalance in the use of transportation modes that it creates.
- Citizens need to evaluate methods for more efficient use of the automobile to protect the environment, reduce congestion, and conserve energy.

ACTIVITY

Students respond to the following scenario and instructions:

I hadn't been so upset in a long time. My car was in the repair shop and, since I couldn't afford a rental car, I had to go three weeks without "wheels" while the mechanic waited for the spare parts to repair my car after the accident. I never realized how badly I would miss my car! When I finally got it back yesterday, I felt as though I'd been let out of prison.

Write down all the reasons you think this person missed the use of a car so much.

Then, break the students into small groups and give them written instructions to read each other's papers and discuss one or more of the following:

1. What responses did you give for why the person was so unhappy during the time he or she was unable to drive?
2. What other reasons do people have for driving cars?
3. Which of these reasons involve the use of cars as (1) an essential (2) enjoyable, and (3) important means of transportation that *public transportation or carpooling could not provide nearly as well*?
4. Explain why people prefer cars to public transportation.
5. Is it desirable and possible to change Americans' attitudes about cars, and if so, how?
6. What arguments are there for using public transportation and carpools in certain circumstances rather than automobiles?
7. How could these arguments be presented to the motoring public effectively and who should be responsible for educating the public to the importance of reducing its reliance on automobiles (or making more efficient use of the automobile--e.g., carpooling), increasing its use of public transportation systems, and helping to attain balance in the use of all transportation modes?

Groups report their conclusions to the class and respond to class comments and questions. You might also raise for discussion additional reasons some people have for traveling by car rather than by public transportation or carpools, such as privacy; convenience: door-to-door service; comfort: regulated heating, uncrowded, seats available; mobility and independence; power symbol; apparent cost-effectiveness: no money is paid during most trips; speed: often less time consuming than other travel modes; impressiveness: driver can show off a big, expensive, sporty or otherwise ego-building car; flexibility: can stop and get out or take side trips at will; and lack of public transportation.

Engage your students in one or more of the following discussion topics (with or without additional research on their part):

1. How can people, as a complement to increased use of public transportation, make more efficient use of the automobile (e.g., through carpooling and trip consolidation)?
2. Which approach to reducing excessive use of the automobile is the public more likely to engage in--increased use of public transportation or more efficient use of the automobile? Although both are helpful ways of attaining balance in all transportation modes, which is more likely to help achieve this balance? Why?

3. What effects might a reduction in the use of the automobile or more efficient use of the automobile have on the economy and on employment opportunities? Which should have priority if there is a conflict between the two: reducing the harmful environmental effects of excessive automobile use or maintaining jobs provided by automobile production and automobile related services?

4. What role have the automobile manufacturers and the highway lobby (a congressional pressure group representing automobile manufacturers, bus companies, truckers, and other groups with interests in highway construction, maintenance, and improvement) played in encouraging America's alleged preoccupation with and preference for the automobile--for example, through the impact of automobile advertisements? (Students can also analyze automobile advertisements to learn to what extent they play to the emotional and psychological aspects of driving a car. Have car advertisements changed as a result of increased gasoline prices and the energy shortage?)

5. Students can discuss what the government's role, if any, should be in promoting reduced use of the automobile, increased use of public transportation, and more efficient use of the automobile.

Conclude the activity by having your students examine their *own* attitudes toward decreasing their use of automobiles and increasing their use of public transportation and carpools. Do they currently use it? How often and for what purposes? If they do not use it or do not use it as much as they might, why don't they? Raise for discussion any reasons for refusing to use public transportation which the class may not have considered, such as the following.

Habit. Some people do the same thing they've been doing for years simply because breaking a habit requires extra effort at first. Often people who can get themselves to break a habit just once and try something different find it much easier the next time to break the habit. For example, some people who never considered using public transportation but were forced to during the energy shortage of 1974-1975 found that having used public transportation once, they found it easy and even enjoyable to continue using it.

Inconvenience. Using public transportation usually requires walking to a bus or train stop and waiting for the vehicle to arrive, whereas people can go right to their cars without apparent delay. However, automobile drivers must sometimes walk from parking lots to their destination, and, more importantly, they often get delayed in traffic.

Safety. Many people feel safer driving in cities or parts of cities than going by public transportation because they fear being assaulted.

Cynicism. Many people believe that there is little or nothing they can personally do to remedy the imbalance in our transportation picture; therefore, they do nothing. "What difference does it make in solving the country's energy or pollution or traffic problem if I take 50 more trips by bus instead of car?" they ask. Of course, if only a few people take action, nothing will be accomplished. If enough people take action, however, it all adds up to a significant result.

Lack of Time. Some people feel it takes too long to travel by public transportation instead of by car. A close comparison of the two may reveal little or no difference between them. Driving an automobile often takes longer than we realize when we consider traffic, traffic lights, searching for a parking place, getting lost, walking from a parking lot to destination and back, and so on.

Discomfort. When driving a car one is always assured of a seat--and usually a comfortable one at that. Public transportation often involves standing or sitting on unupholstered seats and being crowded. However, driving a car can often involve discomfort, too: for example, fighting traffic jams, putting up with the noise of horns tooting, brakes squealing and mufflers roaring, sweltering on hot days (if the car isn't air conditioned), getting tense from near accidents, and so on. Moreover, public transportation can provide opportunities for people-watching, reading, daydreaming, and cat-napping. (One reporter claims 70 percent of the 13 million people who travel by train every day in Japan sleep during the trip!)

Lack of Privacy. Automobile travel affords a respite from crowds and unwanted fellowship. Public transportation, when it is crowded, can feel like an invasion of privacy; even when it is not crowded, some people may not be in the mood to be stared at or "given the once over."

Failure to Provide Emotional Gratification. Public transportation fails to satisfy many of the emotional needs people have that cars can help meet, including needs for status and power.

Conclude the activity by discussing which of the above reasons people may have for refusing to use public transportation may also explain why many people do not join *carpools*. Are there still other reasons some people do not participate in carpools not covered in the above list of objections to public transportation?

Evaluation Method:

Students poll their community to learn whether public opinion regarding public transportation has changed as a result of the energy crisis during the winter of 1973-1974. Did people turn to public transportation at that time because of the energy crisis? Have they retained the habit of using public transportation? If they have not, would they go back to using public transportation if the energy situation worsens? What is their evaluation of public transportation in their own community?

Variation and Supplementary Activity:

Students can keep a log for several days of all the traveling they do by motorized and nonmotorized (e.g., bicycling, walking) modes of transportation. At the end of the week, students tabulate their total number of trips and the number of trips by each transportation mode. A master tally sheet can be developed (or placed on a blackboard), and then the following issues can be discussed:

- How would life be different if there were no way to travel--even short distances?
- If all automobiles suddenly disappeared, how would people get around?
- If you aren't using public transportation or carpools now, for which of your travel needs could you use them?

MINI-UNIT 2

EVALUATING THE FINANCING OF PUBLIC TRANSPORTATION

This mini-unit focuses on how public transportation is and should be funded; it involves students in determining how they think the limited funds currently available for public transportation should be allocated. A presentation on current government funding of public transportation projects is also provided. The central issue of the extent to which the government should subsidize public transportation is treated in the final activity. (You might also consider using Activity 14 from Mini-unit 4 with this mini-unit. Activity 14 involves students interviewing public transportation system employees and administrators to learn what constraints may make it difficult to improve public transportation service.)

It is important that consumers understand the complex issues of public transportation financing so that they can make wise decisions when called upon in their community to take action pertaining to taxation and bond issues for transportation. The government's ultimate goals of attaining balance in the use of all transportation modes rests in large measure on the extent to which public transportation is supported financially by Federal, state, and local government, and the level of such funding will in part reflect what citizens want their government to finance.

In communities in which there is no public transportation, students can conduct the activities in this mini-unit either by imagining they live in a town that does have several modes of public transportation available or by discussing the units' topics in theoretical terms rather than with reference to their own communities. It is important for students living in such communities to engage in this mini-unit because a general knowledge of public transportation funding issues is important to all citizens in a highly technological and mobile society such as ours. Moreover, students living in such communities may some day move to communities where public transportation is available and need to consider whether and how to increase funding for it. Finally, Federal tax dollars are being spent on public transportation, and residents of communities in which there is no public transportation need to evaluate whether they feel this is a wise allocation of their tax dollars.

- Citizens need to evaluate whether the government should be taking additional or different actions to promote increased use of public transportation and attain balance in the use of all transportation modes.

- Public transportation usually requires some form of financial assistance from the government.

- Citizens need to be able to evaluate the costs and benefits of potential improvements in public transportation service.

- Criteria must be developed for use in deciding which public transportation improvements are needed most.

- Citizens need to decide whether any form of travel should be subsidized by the government.

MINI-UNIT 2 LESSON PLAN

Evaluating public transportation financing

Activity #	*Activities*	*Class Time*
4	DESCRIPTION: The class identifies and evaluates funding actions being taken by the Federal government to improve and promote public transportation. GOAL: To know what actions the Federal government is currently taking to promote public transportation.	1-2 periods
5	DESCRIPTION: Students investigate the cost of public transportation in their community and then discuss how transit authorities and government agencies do and should allocate their funds. GOAL: To be familiar with the elements of public transportation budgets.	2-3 periods plus out-of-class time
6	DESCRIPTION: Students debate the cost benefits of different forms of public transportation and of improvement in existing public transportation service. GOAL: To be able to evaluate the advantages and drawbacks of potential improvements in a public transportation system.	1-3 periods plus out-of-class time
7	DESCRIPTION: Students role-play legislators deciding what public transportation improvements or expansions to finance in their community. GOAL: To be aware of some of the possible effects public transportation can have on the lifestyle, employment opportunities, and other aspects of the community.	1-2 periods

MINI-UNIT 2 LESSON PLAN (CONTD.)

Evaluating public transportation financing

Activity #	Activities	Class Time
8	DESCRIPTION: Students analyze extent to which public transportation should be subsidized by the government. GOAL: To be able to evaluate whether public transportation should be subsidized.	1-2 periods

Total Class
Time: 5-10
Periods

ACTIVITY #4

Mini-unit Topic: Evaluating Public Transportation Financing

Approximate Class Time: 1-2 periods

Capsule Activity Description: The class identifies and evaluates funding actions being taken by the Federal government to improve and promote public transportation in America.

Goal:

To know what actions the Federal government is currently taking to promote public transportation.

Concepts Treated:

- The Federal government is promoting increased use of public transportation.
- There are ways in which citizens can support the government's activity on behalf of public transportation.
- Citizens need to evaluate whether the government should be taking additional or different actions to promote increased use of public transportation and attain balance in the use of all transportation modes.

ACTIVITY

Provide your students with the following overview of Federal aid to public transportation:

In recent years the Federal government has assumed an increasingly important role in the development and maintenance of our nation's public transportation systems. In this activity, examine with your students the development of Federal assistance for public transportation and existing Federal programs and objectives.

Federal assistance for mass transportation began in 1961 with an emergency loan program and a small test and demonstration program. In 1964 the Urban Mass Transportation Act established a program of Federal matching grants for preservation, improvement, and expansion of public transportation systems. Amendments to this act have provided broader program goals, higher funding levels, longer periods of assured Federal assistance, and greater flexibility in meeting local needs. Funding increased from $50.7 million in 1965 to $133 million in 1970 to over $1.4 billion in 1976 for the purchase and construction of mass transportation facilities.

The Federal Aid Highway Act of 1973 granted flexibility in the use of highway funds for public transportation purposes by opening urban system funds (previously targeted solely for highways) to transit, both rail and bus, and by opening all highway funds to exclusive lanes for buses, traffic control devices, bus shelters, parking facilities, etc. In addition, interstate highway funds also were made available for non-highway public transportation purposes under certain conditions.

Federal Components

The Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation bears the principal Federal responsibility for providing assistance to public transportation. In addition UMTA cooperates extensively with the Federal Highway Administration (also of the Department of Transportation) in providing a coordinated Federal approach to public transportation programs. Both administrations also work cooperatively with the U.S. Department of Housing and Urban Development and the Department of Health, Education and Welfare.

Immediate Goals

The Federal Government assists and promotes public transportation systems through programs of financial aid to local public bodies (such as municipal governments or local transit authorities) and through research, development, and demonstration grants. Specific goals include the following:

Mobility of nondrivers. This objective is directed to identifying, studying and ultimately serving the transportation needs of the transportation disadvantaged--the young, aged, poor, handicapped, unemployed, and secondary workers. These groups include those who generally do not have reasonable access to alternative forms of transportation and are often deprived of mobility where public transportation is inadequate or nonexistent.

Relief of traffic congestion. This objective seeks improvement in overall traffic movement and travel time in urban regions especially during peak hours of travel demands.

Improving the quality of the urban environment. This objective requires achievement of land-use patterns and environmental conditions that effectively contribute to the physical, economic, and social well-being of urban communities. Public transportation improvements--designed to help reduce the noise, odor, vibration, and other adverse impacts on the urban environment--are to be encouraged as a contribution to the improvement of the environment.*

Examples of Federal Assistance

Capital improvement and planning grants. These grants are awarded to local public bodies and provide 80 percent of the cost for new system equipment and modernization of transit facilities. Local bodies provide the remaining 20 percent of the costs.

Operating assistance grants. These grants are awarded to local public bodies and provide up to 50 percent of the cost of operating a transit system.

Research, development and demonstration. These grants are provided to private and public organizations for studies, tests, and demonstrations of new ideas, methods, systems, and equipment for improved transportation planning and operations.

Technical studies grants. These grants are awarded to local public bodies and provide up to 100 percent (UMTA administrative policy dictates 80 percent) of the cost of engineering plans and design of urban mass transportation systems, and for other planning studies.

Managerial training grants. These grants for advanced training are awarded to personnel employed in managerial, technical, and professional positions in the urban mass transportation field.

University research and transportation grants. These grants are awarded to nonprofit educational institutions and combine comprehensive research and research training in urban transportation problems.

Rural highway public transportation program. These grants are available to public bodies to test possible methods of improving transportation services for rural residents.

The grant process. Each program of the Federal government has specific procedures and requirements for funding. Given below is an example of the grant process for UMTA capital grants.

Public bodies must submit a preliminary application to determine the probable eligibility of the applicant and project and the availability of Federal funds. If a positive decision is reached, then detailed engineering, planning, financial, and legal data must be set forth in a final application. Any application for capital grants must include a transcript or certification that a public hearing was held on the proposed project prior to submittal of the final application.

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*Operation Manual of the Urban Mass Transportation Administration, 1972.

The preliminary application must include such items as a list of capital facilities for which the grant is requested, a description of the current system, benefits to be derived, estimates of the total cost, portion to be financed from local revenues and the source of such funds, and arrangements which exist or will be made to insure continuing public control over the operation or use of facilities. The application must indicate whether the project will adversely affect employees of the transit system or result in relocation of families or businesses and must include a draft environmental analysis.

Priority for UMTA capital grants is given to funding proposals that reinvigorate public transportation in order to provide service attracting new riders regardless of their social or economic group or the purpose of their journey; provide better general service and develop special services to provide for substantial groups of people who are totally dependent on public transportation; and promote transit as a positive force in influencing and supporting desired development patterns in urban areas and improving environmental conditions.

Future Federal Directions

Future directions include providing general fund financial assistance to help urban areas and improve the quality and quantity of public transit. Local urban planners will be encouraged to bear more of the burden of deciding which of the many competing programs they wish to promote, given the limits of financial resources, and which they will defer. These are decisions that can best be made at the local level with Federal help in providing the data, guidelines and criteria needed to make prudent decisions. The government will develop and encourage local areas to implement various incentive systems to force more efficient vehicular usage of our existing streets and highways and will continue to seek better mass transit technology.

After this general overview, give specific examples of programs the government has funded to achieve both its general objectives of providing safe, convenient, and fast public transportation services and also its specific goals described above. Examples of government activity are provided at the end of the activity.

After the presentation, discuss with students the following issues:

1. How can citizens help the Federal government take effective actions to promote public transportation--for example, by attending hearings, by writing their opinions to the government, and by getting involved in regional transportation planning efforts?

2. Does it seem that the government's actions are effective? How can you tell? Are they appropriate? Why?

3. Are there other actions the government should be taking but isn't? If so, what are these actions? Why might the government not take these actions? What constraints may make it difficult for the government to take further action? Are there or have there been in the past pressures on the government not to allocate funds for public transportation?

4. Should the government promote the use of carpools? Why? How?

Evaluation Method:

Students poll the public regarding its knowledge of how the government is promoting public transportation and seek to learn what government measures in this regard the public is interested in seeing the government take.

Variation and Supplementary Activity:

Students can research whether their transit authority has received assistance from the Federal, state, or local government.

Federal Government Support of Mass Transit In Recent Years*

Funds to Communities for Improvement and Purchase of Public Transportation Facilities and Vehicles

These include a grant of $474,852 to the County of Hawaii to assist in the purchase of ten new passenger buses, bus signs, and related equipment; a grant of $107 million for transit improvements in the Chicago, Illinois metropolitan area (including $75 million to the Chicago Transit Authority for extensive renovation, installation of service and maintenance equipment, and the purchase of 600 new buses; $12 million to the West Suburban Mass Transit District for the purchase of 20 new double-deck rail commuter cars, four locomotives, spare parts, and related items; and $11 million to the Illinois Department of Transportation to assist in the purchase of land and construction of commuter rail passenger automobile parking facilities in 19 suburban communities. The grant also includes relocation payments for persons and businesses that are displaced by the construction); a grant of $800 million to the

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*Contact the Urban Mass Transportation Administration, U.S. Department of Transportation, Washington, D.C. 20590, for a list of the most recent grants awarded for public transportation.

Metropolitan Atlanta Rapid Transit Authority (MARTA) to assist in the construction of its rapid transit system (the most significant single Federal transit commitment ever made to any urban area in the nation); a grant of $2,870,068 to the Delaware Authority for Regional Transit (DART), Wilmington, Delaware for the purchase of 48 new passenger buses, nine service and maintenance vehicles, 113 two-way radios, 48 fareboxes, 43 bus stop shelters, 2,000 bus stop signs, and environmental improvement equipment; and grants worth $20,800,000 to 50 states for direct transit assistance to elderly and handicapped persons (with these funds, a total of 2283 vehicles are being purchased to aid the mobility of elderly and handicapped persons).

Funds for Demonstration Projects

These are projects in various communities that seek to indicate the success of different public transportation innovations, such as projects designed to test accessibility of public transportation for the handicapped and the elderly, or new marketing and management techniques. For example, a grant of $495,500 was awarded to the Lower Naugatuck Valley of Connecticut for a system including limited fixed route service, flexible route-demand responsive service, contract bus service for social service agencies, and an automated collection system using credit cards and monthly billings. A grant of $415,984 went to the New York Metropolitan Transit Authority and $334,375 to the Southern California Rapid Transit District to examine the feasibility of double-deck buses in regular transit routes and to study public acceptance of the buses.

Funds for Industry and Research Institutions

These grants to research the development of new or improved public transportation vehicles and facilities include a contract of $8 million for the construction of an experimental prototype of a two-car advanced concept train (ACT-1) to be powered by a revolutionary energy-storage flywheel propulsion system to utilize electric power more efficiently and an operational data collection system whose objective is to develop an integrated set of equipment that will automatically measure and record bus passenger activity, revenues collected, and miles driven and relate this activity to time points on a line or route, thereby improving on present techniques of collecting and handling information concerning a day's activity on a bus essential for management decisions and measurement of service performance; by July, 1975, two "off-the shelf" and three development automatic passenger counters, a registering farebox, an electronic odometer, and an on-board cassette recorder will have been tested, the counters in revenue service. Another grant went for an intermodal automatic fare collection system to develop a fare-collection device for buses that can accept magnetic cards utilized by rapid rail transit systems, thus improving passenger convenience and the collection of data concerning total systems revenue and passenger activity.

If the tests are successful, specifications will be written and action taken to procure two engineering prototypes of the integrated system in 1976. Successful testing of the prototypes would be followed by production and demonstration in 1977. Also being developed is the Transit Security System Demonstration: the goal is to install, demonstrate, and evaluate the effectiveness of security devices and techniques at selected rail transit stations on the Chicago Transit Authority system. Such devices include closed-circuit TV monitoring, public address system, emergency telephones and alarms, and ticket agent alarms and intercoms.

Funds for Research and Training

These funds go to communities and educational institutions for research and for training managerial, technical, and professional personnel in the urban mass transportation field. One such grant of $150,000 went to the Massachusetts Institute of Technology to provide research on control procedures for Dial-A-Ride, a bus system in which people phone the bus company requesting the bus stop at their home.

Promotion

These encourage the use of public transportation through a comprehensive marketing and education plan. For example, the Transit Marketing Program Demonstration seeks to support the community plans and service development as an integral part of the Transit Marketing Project begun in FY 1974. The Transit Marketing Project is designed to develop a basic transit marketing methodology and to demonstrate its validity. The market research phase of the project was completed in July 1975. Transit service planning, service modifications, communication and user information in each of the test cities, Baltimore and Nashville, will be funded by this program. Results of the marketing project are intended for nationwide dissemination.

The Transit User Information Project's objective is to demonstrate the application of a comprehensive series of activities for conveying information about transit services to the public. It is specifically intended to demonstrate the effectiveness of dissemination techniques and tools currently being developed. Market research indicated a significant need to facilitate access to transit information for current and potential transit users. This need reflects the increasing complexity of transit schedules and routes, the use of a variety of fare structures, and the general unfamiliarity of nonusers and new riders with transit systems. In this context, effective information dissemination is critical to wider public utilization of mass transportation.

The Transit Industry Marketing Handbook project seeks to develop a marketing manual for transit managers. The manual will include substantial new transit marketing information and techniques resulting from considerable advances in the state of transit marketing and, equally significant, changes in the marketplace. The Manual is being developed in response to the industry's need for a basic source of information for transit marketing, a basic element of improving system productivity and efficiency. This guide brings together, in a single convenient source, all the major information relating to transit marketing. Timely revisions will assure continued relevance of this Manual to the transit manager.

The MBTA prepaid pass evaluation enables the Massachusetts Bay Transit Authority to evaluate the concept of a prepaid transit pass program designed to promote the increased use of transit by allowing employees to buy annual travel passes through convenient payroll deduction. Employers participating in the program include the John Hancock Mutual Life Insurance Company, the City of Boston, the Commonwealth of Massachusetts, and the U.S. Department of Transportation's Transportation Systems Center.

A final program concerns transit marketing training and education. This has three parts: (1) a two-day seminar for general managers, transit board chairmen and other appropriate high-level decision makers for transit systems in SMSAs of over 200,000 population; held June 9-10, 1975, the seminar gave them a comprehensive, working knowledge of marketing. (2) a 2½ day workshop for transit marketing personnel; held June 18-20, 1975, the workshop afforded them an opportunity to improve their understanding, knowledge, and ability to use marketing; the basic course for teaching transit marketing at colleges will be developed along with appropriate support materials. The course and materials will be distributed to appropriate educational institutions for inclusion in existing or contemplated transportation courses. UMTA will also assist a major university in establishing an annual two-week marketing training seminar for novice transit marketing personnel.

ACTIVITY #5

Mini-Unit Topic: Evaluating Public Transportation Financing

Approximate Class Time: 2-3 periods, plus out-of-class time

Capsule Activity Description: Students investigate the cost of public transportation in their community and then discuss how transit authorities and government agencies do and should allocate their funds.

Goal:

To be familiar with the elements of public transportation budgets.

Concepts Treated:

- Passenger fares usually provide only a portion of any public transportation system's operating expenses.
- Public transportation usually requires some form of financial assistance from the government.
- Public transportation systems have several elements requiring funding, including salaries and equipment maintenance.
- Priorities must be established in order to decide at what level to fund each element in a public transportation system.

ACTIVITY

This activity has two parts: in the first, students research how public transportation is actually funded in their community; in the second, they discuss how they feel a given public transportation mode should allocate the monies it has available.

Part One: Research on Public Transportation Funding

Students develop a brief questionnaire designed to learn how public transportation is funded in their community. Questions might include the following:

- What percentage of our town's total budget is allocated to public transportation?

- Has this figure changed over the years?

- What items need funding in our particular public transportation system?

- What percentage of the available monies are spent on each item?

- What are the fixed costs (e.g., salaries, gasoline, repairs, insurance)?

- Who is responsible for establishing these allocations?

- What role can the public play and should it play in determining what these allocations should be?

- Where does the money come from that finances the public transportation system? What percentage of the funds comes from fares?

The class then divides into small groups and each group interviews the representatives or officials of a different public transportation mode available in their community. (If there is only one mode, different officials from that mode can be interviewed by different groups of students. If there is no public transportation in the community, students conduct only Part Two of the activity.)

After conducting their interviews, the class discusses whether it feels the town's allocations for public transportation are adequate and whether the particular modes whose finances they were able to research allocate their funds appropriately for various needs (such as salaries, equipment maintenance, public relations, and advertising).

Part Two: Discussion of Allocating Public Transportation Monies

Students begin this second part of the activity by breaking into small groups and responding to the following scenario:

> You represent the local transit board in your community and are responsible for running the town's bus system. There are ten buses to service the 100,000 people in your community. The town council has provided you with an appropriation of $100,000 to spend as you see fit on the bus system next year. In addition, you can expect to take in $83,000 in fares next year. The town council would like to know how the transit board intends to spend the money and what additional funds might be required.

1. What costs are involved in the operation of a bus system (e.g., salaries, gasoline, insurance, maintenance and repair of buses and facilities)?

2. Which of these are fixed and recurring costs over which there is little discretion?

3. Is the total budget of $183,000 sufficient to operate the bus system for one year? Can the budget be reduced? If not, where can the town go for additional funds? Can it qualify for Federal or state funds?

4. Are improvements needed for the system (e.g., new buses, bus shelters)? Are there sufficient funds remaining from the $183,000 available? Would the town qualify for grants from the Federal or state government?

Teacher's note: Listed below are examples of the size of bus systems and the source of financing for cities of 100,000 and one million people:

Population	1,000,000	100,000
Number of buses	400	10
Passenger fares	$11,000,000	$ 83,000
City support	$ 3,500,000	$100,000
Federal support	$ 3,500,000	$100,000

After answering these questions, each group reports its results to the class and discusses both any differences about which items will need financing and also disagreements over what level of funding each item should receive.

The class concludes the activity by comparing the level of funding the various groups felt *should* be operating for their hypothetical bus system with the *actual* allocations in their communities they identified in their earlier research. Finally, students can consider the allocation issue not only from the perspective of the town's officials and from their own simulated perspective as town council "members" but also from a third perspective--their own true opinions as taxpayers, users, or potential users of public transportation, commuters, and family budgeters. If there are discrepancies among the allocations based on these three perspectives, which group's allocations should have precedence? Is a compromise possible? Why do these different perspectives clash (if they do)?

Evaluation Method:

Students poll the public or other students to learn how these respondents think public transportation modes allocate their funds and how they feel these funds should be allocated.

Variations and Supplementary Activities:

Students can investigate from where the town's money for public transportation comes--property taxes? the state? the Federal government? a combination of sources?

Students can debate one or more public transportation funding issues, such as "Resolved, that 25 percent of the bus system's funds for next year should be spent on installing pollution controls on buses."

ACTIVITY #6

Mini-unit Topic: Evaluating Public Transportation Funding

Approximate Class Time: 1-3 periods, plus out-of-class time

Capsule Activity Description: Students debate the cost benefits of different forms of public transportation and of improvements in existing public transportation service.

Goal:

To be able to evaluate the advantages and drawbacks of potential improvements in a public transportation system

Concepts Treated:

- Most improvements in public transportation service involve financial and sometimes other costs as well as benefits.
- Citizens need to be able to evaluate the costs and benefits of potential improvements in public transportation service.
- Sometimes these improvements require additional or special local taxes or bond issues in addition to Federal and state funds.

ACTIVITY

Begin the activity with a brief discussion of the concept of cost-benefit. Cost-benefit involves answering the questions "How much will it cost to achieve what specific benefits?" and "Are the benefits worth the cost?" Costs can be not only financial, but also social and personal. For example, what would it cost to provide ten new buses? Who would pay the costs? What would the benefits be from such a development: how many more passengers would be served, how much rush hour crowding would be relieved, and what new neighborhoods could be served? Before promoting a public transportation improvement, citizens need to consider the cost-benefits of the measure they are advocating to determine whether their goal is worth seeking.

You can provide an example of a cost-benefit analysis by discussing with the class the relative advantages and disadvantages of light rail as opposed to buses. For example,

- Light rail is less expensive to operate: several cars can be hooked together and run by a single operator.

- Light rail requires heavy initial expenses for track and roadbed construction.

- Light rail requires track maintenance.

- Mechanical failure on one streetcar can halt an entire line.

- Light rail can travel quickly, with few or no traffic delays.

- Buses have a high operating cost (gasoline, repairs, etc.) and depreciate more quickly than streetcars.

- Buses are flexible: they can travel down most streets and be rerouted as new travel needs occur.

- Buses pollute; light rail is nonpolluting because it runs on electricity.

- Light rail is not feasible in a community unless rights of way are available or can be made available.

After this initial cost-benefits discussion, small groups of four to eight students briefly research (if necessary) and then debate the pros and cons of a different public transportation improvement or expansion. Each group chooses an issue and decides who is going to defend which position on the issue. Groups then split into two or three debate groups and each subgroup researches its point of view. Subgroups can conduct research by discussing and refining arguments for their position, and predicting the opposing side's arguments and developing counter-arguments; reading available literature; and interviewing appropriate members of the community and officials in governmental, private, and public agencies.

After completing research, groups agree on how much time to allow each side to present its arguments, rebuttals, and concluding remarks. Each group decides who will judge the debate (other students? other teachers?) and how the debate will be scored. Students can create debate topics around hypothetical public transportation improvements or select improvements that have been recently instituted or are currently under consideration in the community or elsewhere in the country. Students debate the issues in terms of the cost-benefits involved. Sample hypothetical issues which students can debate follow.

- Resolved, that the town should buy ten new buses.

- Resolved, that all the buses should be air-conditioned.

- Resolved, that special bus lanes should be provided on all major highways during rush hour.

- Resolved, that cars should be banned from the central business district between the hours of seven and ten on weekday mornings.

- Resolved, that parking meter rates should be doubled.

- Resolved, that a tunnel (bridge) should be built under (over) ____________________lake (river, etc.) for use by rapid transit trains.

- Resolved, that the subway should be extended to ______________.

- Resolved, that dial-a-ride (buses picking up passengers who call in for a ride) should be instituted in the __________________ section of town.

- Resolved, that fares on the buses should be doubled (halved, eliminated for the elderly, etc.).

- Resolved, that schools should conduct at least a one-week unit on public transportation at the elementary, junior, and senior high levels.

- Resolved, that ferry service should be provided between ____________ and _____________.

- Resolved, that the town's buses be redesigned to accommodate the handicapped.

- Resolved, that buses should (not) institute an exact fare (no change made) system.

- Resolved, that each subway train (or bus) should have an armed security guard on it at all times.

- Resolved, that youngsters and adults who vandalize public transportation facilities should be prosecuted to the fullest extent of the law.

- Resolved, that the Federal (state, city, etc.) government should actively publicize and promote the use of public transportation.

Evaluation Method:

Students apply cost-benefit analysis to recent, current, or proposed improvements in a local or well known public transportation system.

Variations and Supplementary Activities:

After each topic is debated, one or both teams can make an appointment with an appropriate government agency to present its conclusions and solicit responses.

Activity can be conducted as a class discussion.

Students can discuss *who* should determine whether the costs outweigh the benefits on a particular public transportation improvement.

Students can research what the cost-benefits have been on earlier public transportation improvements.

Students can research the political process by which a public transportation improvement was instituted, blocked, or instituted and then rescinded.

Students can invite representatives of a community or government agency to class to discuss the class position on various possible public transportation improvements.

ACTIVITY #7

Mini-unit Topic: Evaluating Public Transportation Funding

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students role-play legislators deciding what public transportation improvements or expansion to finance in their community.

Goal:

To be aware of some of the possible effects public transportation can have on the lifestyle, employment opportunities, and other aspects of the community.

Concepts Treated:

- In most communities, more improvements in public transportation service are needed than there are funds to finance them.
- Criteria must be developed for use in deciding which public transportation improvements are needed most.

ACTIVITY

Break the class into small groups of three or four students and give each group the following role profile:

> You are in a committee meeting with three other members of the town subcommittee on transportation. Your committee makes recommendations to the town council on all transportation issues for your community. During the last few years, traffic congestion and air pollution have become problems in your community. The town council has asked your committee to develop both immediate and long-range plans to reduce traffic congestion and pollution from automobiles. They have indicated their willingness to support improvements to the public transportation system with the limited financial resources which they have available, but feel that they will probably have to seek assistance from the state and the Federal government, at least on long-range solutions. They also feel that some

of the surrounding communities should assist in their efforts since some of their residents work in the town. The town council has indicated that they can provide $_______ (50,000 population: $100,000; 200,000 population: $500,000; 500,000 population: $2,000,000; 1 million population: $25,000,000)* from this year's budget.

What recommendations will you make to the subcommittee and how will you support those recommendations? Immediate solutions you might wish to suggest that the subcommittees consider include a downtown bus loop; incentives for increased use of carpools; purchase of new buses; and increased taxes on parking (increased town revenue might then be channeled to public transportation operations). Long-range goals might be the addition of subway stops, new bus routes, commuter rail extensions; a light rail (trolley) system; construction of fringe parking facilities; special lanes for buses; and auto-restricted zones. You then can choose to instruct the subcommittees to specifically consider one or more of the following issues in their deliberations:

1. What will the environmental effects of the new or expanded system be?

2. What effects will the expansion or improvement have on the use of automobiles and traffic congestion?

3. Will the expansion provide employment opportunities for community residents? Is this an important consideration to be kept in mind?

4. Will the expansion create a need for additional transportation facilities to service the new or extended system--for example, new parking facilities? waiting stations?

5. Will the expansion require land that must be taken from homeowners, renters, businesses, farms, or community agencies?

6. How much will each project cost? Where will the money come from (bond issues; increase in taxes; Federal government; state government)?

7. Will the surrounding communities cooperate in the plan?

After making their decisions, subcommittees report their choices to the "town council" (class) which criticizes and questions the choices. In particular, the class compares the different choices the various subcommittees made and their reasons for their selections. Stress the importance of master planning in the development of new or expanded public transportation systems, such as involving all citizens and citizen groups in the planning effort; considering all possible effects of the construction, expansion, or relocation on the community in general and on other transportation problems and facilities in particular; and preventing future problems before they occur rather than trying to solve problems once they exist.

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*Fill in the appropriate amount.

Last, the class discusses the general criteria that can be applied to the decision of what public transportation system improvements can and should be made in a community. The class does this by analyzing the reasons the subcommittees gave for selecting a particular public transportation improvement and generalizing from those reasons. For example, if a subcommittee opposed a commuter rail line extension because of the number of homes that would have to be displaced to construct it, the class can identify "extent of people displacement" as a criterion by which to evaluate public transportation expansion. Other possible criteria follow.

1. How many people will be negatively affected versus how many people will be benefited?
2. How serious will the negative effects be? How beneficial will the positive effects be?
3. Are there any opportunities for those affected to avoid the negative effects?
4. Will there be harmful effects on the natural environment--for example, wildlife, open space, plants, trees?
5. Can major changes in land use around the proposed extension be anticipated?
6. Will there be a significant reduction in the use of automobiles and therefore of pollution or traffic congestion?
7. Will travel by those with transportation handicaps be facilitated--including travel by the handicapped, the elderly, the poor, children, and the geographically isolated?

Evaluation Method:

Students interview community residents on their opinions about what public transportation system expansions are most needed and why.

Variations and Supplementary Activities:

Students can be assigned roles of various community people and asked by the subcommittees to testify on needed public transportation.

If the "town council" voices strong objections to one or more subcommittee choices, it can send the committee back into session to reconsider their decision.

Students can select a recent or current public transportation expansion effort and research the extent to which it was or is being evaluated in terms of the concerns the various subcommittees raised about the proposed plans.

Students can invite officials from the community's public transportation systems to class to discuss what kinds of additions to the public transportation system they feel would be desirable. These officials can evaluate the subcommittees' choices.

ACTIVITY #8

Mini-unit Topic: Evaluating Public Transportation Financing **Approximate Class Time:** 1-2 periods

Capsule Activity Description: Students analyze the extent to which public transportation should be subsidized by the government.

Goal:

To be able to evaluate whether public transportation should be subsidized.

Concepts Treated:

- In most communities, public transportation cannot operate solely with revenues generated by fares.
- There are many programs in the public interest requiring financial assistance from different levels of government.
- Citizens need to decide whether any form of travel should be subsidized by the government.

ACTIVITY

In most communities, passenger fares do not provide sufficient revenues to operate the local public transportation system. For example, in 1975 passenger revenues throughout the U.S. accounted for only 54 percent of all transit operating revenues, and public transportation systems had a combined net operating loss of $1.7 billion. All levels of government have been called upon to respond to the financial problems of public transportation. In 1975 alone, local governments provided $699 million, state governments, $400 million and the Federal government, $302 million in operating subsidies to transit authorities. This does not include the substantial capital costs (e.g., the purchase of buses and other equipment) now supported substantially by the Federal government ($1.4 billion in 1976).

In most European countries, public transportation has been heavily subsidized by the government for years. However, in the United States the question of whether government should provide substantial subsidies for public transportation is still a matter of concern.

Before addressing the issue of subsidies for public transportation, students should consider why it has not been possible in recent years for transit systems to be self-supporting by examining such issues as the decline in ridership since the 1940s; higher cost of operation (e.g., salaries, gasoline, etc.--note that operating costs per passenger vehicle mile have risen from 20¢ in 1940 to nearly 60¢ in 1960 to nearly $1.80 in 1975, and the average salary of transit workers has increased from $1773 in 1940 to $5481 in 1960 to $13,993 in 1975); and difficulty in raising revenues (e.g., fare increases and their often negative impact on ridership and revenues).

Students should then consider the types of assistance provided to various modes of transportation and to other transportation programs in the public interest. Many such programs have been a regular part of government services for years whereas assistance to public transportation is a fairly recent addition. As late as 1968, the Federal government provided only $1.1 million for mass transportation, while annual Federal support for highways totalled over $2 billion. (However, buses and carpools also use highways.) Examples of the current Federal support for public transportation are given in Activity 4. Examples of assistance for automobiles and highway travel are given below, for a starting point in the discussion.

Until recently the Highway Trust Fund, which is composed of the four-cent tax on gasoline and other miscellaneous taxes on motor vehicles and equipment, was restricted to highway-related activity. In 1973, legislation opened a portion of the Highway Trust Fund to public transportation projects. However, the majority of the trust fund remains committed to highway-related functions. Is the trust fund a form of subsidy to the highway user or are drivers of motor vehicles contributing to the cost of the highways they use by paying the four-cent gasoline tax and other taxes which make up the Highway Trust Fund?

The oil depletion allowance provides a tax break for oil companies. Is it a form of subsidization for automobiles because it enables gasoline companies to charge lower gasoline prices to people who use cars?

Cities and towns use real-estate taxes partly to build and maintain streets and roads. Is this a form of subsidy for the automobile because residents who live in central city areas and tend to have fewer cars and use them less than other city residents must contribute to the support of roads they may not use at all or very often?

The expense of policing and maintaining (repairing, plowing in winter, etc.) highways and of traffic signals and court time (to process traffic offenses) costs most communities much more than automobile drivers contribute in gasoline and car excise taxes. Does this amount to a form of subsidy for automobiles, since the tax money used to pay for these services is contributed by nondrivers as well as drivers?

Many or most highways and roads are built to accommodate rush-hour traffic. Does this mean that people who drive at other times of the day are in effect subsidizing those who use the roads during peak-hour commuting?

Is free parking in company parking lots a fringe benefit provided in place of higher salaries which therefore favors automobile owners over nonowners? Should companies subsidize workers who commute by bus, train, or subway by paying all or part of their commuting costs?

After considering different types of government assistance, students should address the issue of whether it is in the public interest for government to assist in the operating and capital costs of public transportation. Use the following statements as points of debate:

Argument One. Public transportation should be considered a vital feature of living in a community, like garbage collection, sewer waste disposal, and police and fire protection. Just as many communities provide these services out of the general tax revenues, so should they provide public transportation.

Argument Two. Citizens can select between public transportation and the automobile. In a number of ways, most citizens have clearly indicated their preference for automobile travel. Government officials should therefore seek to make automobile travel as efficient and safe as possible, rather than spend tax money on public transportation.

Students might also consider the effects on society if public transportation service were eliminated or reduced substantially. Students might examine the effects of recent public transportation strikes to gain an idea of what it might be like without public transportation.

Evaluation Method:

Students poll the public or other students on the issue of to what extent public transportation should be subsidized.

Variations and Supplementary Activities:

Students can examine the revenue problems and revenue sources of the transit system in their area.

Students can examine the sources of local government contributions to their community's transit system (e.g., property taxes, sales tax).

MINI-UNIT 3

PUBLIC TRANSPORTATION: WHAT ARE THE PROBLEMS?

In this mini-unit students identify the problems public transportation has meeting the needs of the public, be it the average urban citizen, a handicapped child in the suburbs, or a rural family. Along with gaining awareness of these "system" problems, students learn the advantages and disadvantages each citizen must recognize and weigh when choosing how to travel.

Among the concepts dealt with in this mini-unit are the following:

- Several million Americans have difficulty using public transportation because of socioeconomic and physical handicaps.
- Rural communities tend to lack adequate or any public transportation.
- A major feature of public transportation that alienates many existing riders and drives away potential riders is overcrowding during rush hour.
- The public needs to be aware of the travel handicaps and attitudes many people have regarding public transportation in order to decide whether the government should provide public transportation that these persons are able and willing to use effectively.

The first two activities in this unit do not provide any obvious solutions to these problems--this is something students must come to grips with themselves. However, the last activity in the unit does illustrate a method the government is promoting to alleviate one of the problems public transportation and its riders must constantly face--rush hour overcrowding. This unit is logically followed by Mini-unit 4. The activities contained there present steps that citizens can take to promote and achieve improvement in public transportation service.

This unit also provides the opportunity for students to relate, compare, and analyze their own personal experiences using public transportation and their own personal feelings about public transportation, since most class members will not only have had some experience using public transportation, they may also have had some problems using it.

For communities in which there is little or no public transportation, the benefits in studying this mini-unit are the same as those enumerated in the introduction to Mini-unit 2; lack of local public transit does not reduce the importance of this unit's concepts for any community.

MINI-UNIT 3 LESSON PLAN

Public transportation: what are the problems?

Activity #	*Activities*	*Class Time*
9	DESCRIPTION: Students research the ways in which public transportation meets and fails to meet the needs of the community. GOAL: To know how public transportation fails to meet the needs of many citizens.	3-5 periods, plus out-of-class time
10	DESCRIPTION Students investigate why public transportation service in many communities is inadequate. GOAL: To know why public transportation service in many American communities is often inadequate.	2-4 periods, plus out-of-class time
11	DESCRIPTION: Students learn how greater use of public transportation can be stimulated by regulating the commuting behavior of the public. GOAL: To be aware of how changing the commuting behavior of the public may reduce congestion on public transportation vehicles during rush hour.	1-2 periods

Total Class
Time: 6-11
Periods

ACTIVITY #9

Mini-unit Topic: Identifying Public Transportation Problems

Approximate Class Time: 3-5 periods, plus out-of-class time

Capsule Activity Description: Students research the ways in which public transportation meets and fails to meet the needs of the community.

Goal:

To know how public transportation fails to meet the needs of many citizens.

Concepts Treated:

- Different people have different reasons for using and not using public transportation.
- Several million Americans have difficulty using public transportation because of socioeconomic and physical handicaps.
- The public needs to be aware of the travel handicaps many people have in order to decide whether the government should provide public transportation these persons can use effectively.
- One partial solution to the lack of public transportation available to the transportation handicapped may be carpooling.
- Citizens and transportation officials need to consider the cost of redesigning existing facilities and the added cost of new facilities to accommodate the needs of the transportation handicapped.

ACTIVITY

This activity is divided into two parts. In the first part, students discuss how people with transportation handicaps may find it difficult or impossible to use public transportation. In the second part, students poll the general public, including people with travel handicaps, to learn their views on the accessibility of public transportation.

Part One: Identifying the Problems of the Transportation Handicapped

Students can conduct part of this activity with reference to the needs of special groups across the country (for example, the poor in general), with reference to special groups in their own community, or both. Students begin the activity by identifying people who are likely to have special transportation needs due to socioeconomic conditions, including the poor and minorities, and due to physical handicaps, such as the elderly, the blind, the deaf, and the crippled.

Students, either in small groups or as a class, then identify from the following list the features of each mode of public transportation that are likely to represent problems for each handicapped group: convenience, safety, expense, speed, comfort, privacy, accessibility, and availability.

The small groups can compare their results and resolve disagreements. Based on the results, students can then identify those modes of public transportation likely to be most accessible to each handicapped group and assess the expense involved in making these modes accessible to them. Students should also consider whether and how carpooling might help provide increased transportation opportunities for the poor and the physically handicapped who cannot take advantage of public transportation as much as they would like. As follow-up, students identify what changes, if any, could be introduced into each mode of public transportation to make it more accessible to each handicapped group. (Prior to or after this part of the activity, you may want to discuss the issues included in the two readings at the end of this activity, or duplicate the readings and pass them out to the class. The first reading describes some of the travel difficulties experienced by handicapped people voiced at a series of national consumer hearings on transportation problems. The second reading describes some innovative programs designed to modify public transportation service and vehicles to accommodate the needs of the transportation handicapped.)

Part Two: Polling the Public

As the second part of this activity, students, either as a class or in small groups, design one or more polls for learning the following information from users of public transportation:

1. What do they like about the different public transportation modes (bus, taxi, subway, etc.) in the community?

2. What modes have they found to be particularly efficient, safe, and pleasant?

3. What grievances, if any, do they have against any public transportation modes?

Different students or groups of students can develop polls designed to elicit information about different public transportation modes in the community. (If there is no public transportation in the community, students can poll the public regarding the modes of public transportation citizens would *like* to have provided in the community and why.)

Among the groups polled should be individuals who have travel handicaps. After conducting their polls and tabulating and analyzing the results, the students can then compare their earlier conclusions about how the travel handicapped may have difficulty using public transportation with the opinions these people themselves gave in response to the questionnaire. In addition, the class can compare the experiences of the travel handicapped who have used public transportation with the experiences of the other people who were polled.

After conducting their polls, students tabulate and analyze the results and report to the class the answers to whichever of the three questions listed above was asked. Two sample polls are provided at the end of this activity.

Evaluation Method:

Students interview local transportation officials to learn what possible improvements could be made in the local public transportation system to accommodate the needs of the public in general and of the transportation handicapped in particular.

Variations and Supplementary Activities:

Students can research or estimate the expense involved to make specific modifications in different public transportation systems to make them more accessible to the transportation handicapped. See the reading, "Mobility for the Disadvantaged," at the end of this activity.

Students can invite members of these specialized groups or officials and operators of the public transportation system to class to discuss the travel problems these groups experience.

Students can research the extent to which the needs of these groups are considered in the planning stages of new public transportation vehicles.

Students can discuss and research the extent to which the special needs of the transportation handicapped are not met because of the expense, because these groups do not constitute a powerful lobby, because the nonhandicapped population does not care about the needs of these groups, and because of difficulty in updating existing facilities and equipment.

Students can discuss or research (using interviews) the extent to which women have special problems using public transportation, in terms of facing dangers (theft, assault, verbal abuse, discrimination) men either do not face or face less often.

Students can research what actions the government is taking to improve the accessibility of public transportation for the handicapped. See, for example, the reading "Mobility for the Disadvantaged" at the end of this activity.

Students can compare their community's public transportation systems with those of another community in terms of providing accessibility to the transportation handicapped.

Students can discuss whether consumer grievances about public transportation services should be publicized and whether the public should be encouraged to register complaints with appropriate authorities.

Students can discuss how the public can be motivated to seek actively to have its grievances redressed.

Students can conduct a poll to learn how the public rates public transportation service compared with that of airlines, intercity bus companies, and automobile manufacturers and mechanics.

Students discuss whether consumers should be encouraged to indicate to public transportation system authorities their positive experiences using public transportation systems and, if so, how.

Students can poll the public on its experiences with carpooling or on its thoughts about this mode of semipublic transportation.

Sample General Poll of Consumer Satisfactions with and Complaints Against Public Transportation Systems

Sex: M F

Age: under 12 12-18 19-29 30-59 over 59

Do you drive a car: Yes No

How often do you use each of the following forms of public transportation?

	Never	*Once or Twice a Month*	*Once or Twice a Week*	*Several Times a Week*	*Nearly Every Day*
Bus					
Commuter train					
Subway					
Ferry					
Taxi					
Light rail (trolleys)					

1. When you use public transportation, do you find it to be satisfactory in terms of

☐ Safety?

☐ Comfort?

☐ Convenience?

☐ Speed?

☐ Privacy?

☐ Expense?

☐ Accessibility?

☐ Availability?

2. Have you any general complaints about public transportation services in terms of

☐ Safety
☐ Comfort?
☐ Convenience?
☐ Speed?
☐ Privacy?
☐ Expense?
☐ Accessibility?
☐ Availability?

3. Do you have any specific grievances against a public transportation service? If so, what are the most serious complaints?

____

____

____

____

4. Have you done anything about your grievance? If so, what have you done? What have the results of your actions been?

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5. If you have not done anything, why not?

____

____

____

____

Sample Specific Poll on Consumer Satisfaction with and Complaints about Bus Transportation

Sex: M F

Age: under 12 12-18 19-29 30-59 over 59

Do you drive a car? Yes No

How often do you use buses for everyday transportation needs?

☐ Never

☐ Rarely

☐ Once or twice a month

☐ Once or twice a week

☐ Several times a week

☐ Nearly every day

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1. When you use buses, do you find all of the following to be satisfactory as a rule?

(a) Safety? Yes ☐ No ☐

(b) Comfort? Yes ☐ No ☐

(c) Convenience? Yes ☐ No ☐

(d) Speed? Yes ☐ No ☐

(e) Crowding? Yes ☐ No ☐

(f) Expense? Yes ☐ No ☐

(g) Reliability? Yes ☐ No ☐

2. Have any of the following happened to you several times while traveling by bus?

(a) Bus doesn't show up at all? Yes ☐ No ☐

(b) Bus is late arriving or reaching its destination? Yes ☐ No ☐

(c) Bus is dirty inside--floor or seats? Yes ☐ No ☐

(d) Operator is discourteous or uses insulting language? Yes ☐ No ☐

(e) Operator drives illegally or dangerously, such as

Speeding?	Yes ☐	No ☐
Tailgating?	Yes ☐	No ☐
Running red lights or stop signs?	Yes ☐	No ☐
Failing to stop completely at railroad tracks?	Yes ☐	No ☐
Failing to come to a complete stop to let passengers leave or enter bus?	Yes ☐	No ☐

(f) You have been robbed or threatened? Yes ☐ No ☐

3. Which, if any, of these occurrences do you feel are serious flaws in the bus system's service?

4. If you feel none of them is serious, skip to Question 11. If you feel one or more of them is serious, have you done anything about the problem?

   Yes ☐ No ☐

5. If you haven't, skip to Question 10. If you have what have you done and what have the results of your actions(s) been? (Then skip to Question 11.)

6. If you haven't, why not?

7. In general, how would you rate bus service in your community?

   Poor ☐ Fair ☐ Good ☐ Excellent ☐

The Travel Needs of the Elderly and Handicapped*

Although the highest number of comments from the public hearings were on the general subject of balanced transportation, the most vocal ones on a particular subject came from those concerned about the transportation problems of the elderly and handicapped. Though a minority of consumers think the Federal government should not fund or regulate anything ever, transportation for the elderly and handicapped is one area where there was general agreement that subsidies, regulations, laws, research, and planning are greatly needed. The elderly and handicapped and representatives of organizations working with them turned out in numbers at most of the hearings and articulated their problems and needs repeatedly.

General

Consumers at the hearings believe there is a serious lack of available and accessible transportation for the elderly and handicapped. They believe that transportation for this group of consumers should be considered a right, not a privilege, and that to deny this is not only discriminatory but a denial of their civil rights.

The handicapped in particular repeated their demands at a number of hearings that all public transportation vehicles, terminals, and walkways be designed barrier-free so that even those in wheelchairs can move freely from walkways to buses, terminals, subways, and planes without assistance. They want their needs to be considered in planning all transportation systems and feel that designs that are architecturally barrier-free will not only benefit the handicapped but will help the elderly and other transportation consumers as well. Many who testified clearly believe that the handicapped and elderly lack transportation opportunities because design features prevent use of existing transportation systems. The lower incomes that often accompany elderly and handicapped people also prevent extensive use of most forms of available public transportation because they just can't afford it. In addition, the high cost of transportation hinders some handicapped people and older adults from taking available jobs. Transportation facilities with fewer barriers and door-to-door service, such as taxis and special buses, usually charge fares far beyond their means. Lack of transportation opportunities and prohibitive costs isolate and trap the elderly and handicapped in their homes, deny them access to medical care and job opportunities, and make it difficult to attend church, go shopping, visit friends, or participate in recreational activities. Such confinement sometimes contributes to psychological disorientation and to poor physical health as well.

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*Taken from *The Voice of the Transportation Consumer: Executive Summary* (National Technical Information Service: Springfield, Virginia, 1975).

Many of the elderly and handicapped are dependent upon the kindness of their neighbors and friends because there is no other form of transportation available. They hesitate to ask except for urgent trips. Consumers strongly believe that transportation services for the elderly and handicapped are essential so that these people can be productive to society and have a good quality of life, where possible, as opposed to existing in nursing homes or depending upon government welfare. Some consumers said at the hearings that the costs of providing transportation services for the elderly and handicapped will be more than offset by eliminating some of the need to provide welfare. Many could earn a living, contribute to society, and enjoy more of the pleasures of life if accessible and inexpensive transportation were made available.

Consumers feel that, despite all of the research that has been done on this subject, more is needed to determine the extent of the problem and specific needs and solutions for the various types of handicaps and infirmities. More facts and figures must be developed, and most importantly, information must be obtained from the elderly and handicapped themselves since they are in the best position to accurately reflect and advise on their specific needs. A number of people present at the hearings stated that the Department of Transportation (DOT) and other government agencies are not taking sufficient action to meet the transportation needs of these two groups of consumers with somewhat related needs. They strongly recommend government action to help the elderly and handicapped gain more mobility.

Special Needs

. . . Responses to Question 26 of the questionnaire. . . (which asks the special transportation needs of the elderly and handicapped in the respondent's community) indicate that 53 percent of those responding cite more frequent public transportation services as the most pressing special need. The second category, in order of importance, shows that 47 percent of those responding feel that a discount on fares is important. Because many are retired or are unable to work, incomes are often too low to afford frequent use of public transportation facilities or any other form of transportation; consequently, the plea for reduced or free fares in order that they may not be trapped or isolated. Of those responding to Question 26, 38 percent cite the need for more education and information as to available services and 35 percent want specially designed space on all public transportation systems for the nonambulatory in wheelchairs.

Health Facilities

Public testimony revealed that a strong need exists for low-cost transportation facilities for the elderly and handicapped people to get to and from health clinics in urban as well as rural areas. There is also a need for door-to-door transportation between an individual's home and health facilities for the handicapped and elderly who cannot use existing public transportation systems. This need exists because of their inability to walk to stops, to maneuver wheelchairs over curbs and steps, and to get in and out of buses, trolleys, subways, etc. This door-to-door transportation should be subsidized by the government, many consumers believe, because of the inability of a high percentage of the handicapped and elderly people to pay for this service.

Security and Safety

A major obstacle in the use of transportation systems by the elderly is their fear of being unable to cope adequately with the details of making a trip. This fear is somewhat related to or the result of such infirmities as impaired hearing, poor vision, and poor coordination. Another contributing factor is fear of being attacked or mugged at bus stops, which does happen to some. Consumers believe that bus terminals should have enclosed waiting rooms with security guards present and that subways and other mass transit facilities should be under increased police surveillance.

Bus Transportation

In the categories of transportation by modes, the most serious problems affecting the elderly and the handicapped are those related to bus transportation in urban or metropolitan areas. There are also problems for the elderly and handicapped who travel by bus from one city to another. Neither the buses nor terminals are accessible to the handicapped. Conventional bus design is inadequate for the elderly and the handicapped who are not well coordinated or fully ambulatory. The steps and overhead hand rails are usually too high. In addition, there is inadequate space for wheelchairs; floors are not always skid-free for those who use crutches; there is usually little space for bundles and there is no guarantee of a seat. In public testimony, consumers stated that they want public transit systems to be architecturally barrier-free. In response to Question 26, consumers recommend facilities that will make it easier to board and leave public transit vehicles, including hydraulic lifts if the floor of the vehicle entrance or a ramp cannot be adjusted to curb level. Some newer bus designs being demonstrated, and now in limited use, have such features. Many consumers, especially the elderly and handicapped, believe that all buses should be designed with the problems of the elderly and handicapped in mind and that funding for buses depend on this specification. In Philadelphia, consumers expressed concern over what they termed the lack of adherence to the urban mass transit legislation of 1970 which required special consideration for the needs of the elderly and handicapped. Some requested that minibuses that can accommodate wheelchairs be provided in the interim period until public transportation systems can be made both available and accessible to the handicapped and elderly.

Consumers believe there is a great need for more door-to-door bus service such as dial-a-bus to accommodate the elderly and handicapped who cannot get to the main bus routes. At the very least, there should be a system of feeder minibuses in neighborhoods to take the elderly to the main bus routes; perhaps the handicapped also if feeder and main buses are barrier-free. In response to Question 26 of the questionnaire, a considerable number of people recommend use of special jitneys, dial-a-ride buses, or minibuses, demand activated for the elderly and handicapped. In order to properly sustain the operation of these buses, many consumers believe that the Federal government should provide operating subsidies as well as capital grants. This view was expressed for bus transportation in general as well as for specially equipped buses and door-to-door small buses to accommodate the handicapped and elderly.

In addition to more flexibility in scheduling, consumers want more concentration of stops in those areas having a large number of elderly residents. In several cities, there was a plea for more circuitous routes rather than all routes running into the center of the city. Consumers also believe that Federal funds should be provided for more bus shelters and that more wheelchairs should be available at bus terminals to accommodate the handicapped and the elderly who have difficulty walking. In addition, there should be elevators at accessible locations in terminals. Escalators frighten some elderly people who are not well coordinated and those in wheelchairs must have elevators in terminals with more than one floor if they are to move freely from one destination to another without assistance.

Consumers also asked at the public hearings that fares for senior citizens be lowered or even eliminated entirely during all hours of the day and not just during a limited period of time between daytime commuter rush hours. As noted before, 47 percent of those responding to Question 26 cite a discount on fares for the elderly and handicapped as an important need.

Mass Transportation

There is clearly a need for all mass transportation, not just buses, to be more available and accessible to the elderly and handicapped. As noted previously, this view is supported by the responses to Question 26 of the questionnaire in which 53 percent of those responding feel that more public transportation is a special need of the elderly and handicapped, the single largest percentage in answer to that question. The 47 percent citing discount fares as a need applies to all forms of mass transportation.

Consumers believe there is a need for barrier-free feeder systems from residential neighborhoods to interface with all forms of mass transit systems including the rapid transit systems now being developed in some metropolitan areas. For example, feeder systems to permit the elderly and handicapped to reach rapid transit systems such as BART in San Francisco are needed. BART is designed barrier-free but most feeder systems to BART are not. Consumers feel that most mass transportation terminals, including railroad stations, need redesigning to include elevators and other barrier-free facilities. Certainly the high steps and high hand holds on many transit vehicles and cars should be redesigned for use by the elderly, according to testimony at the hearings. Also, curbs need to be designed with ramps so that the handicapped can move into terminals and get to vehicles and transit cars.

Consumers strongly believe that the elderly and handicapped should be considered in *all* mass transportation planning and that they should be represented on the agencies and committees that plan and make decisions regarding all mass transportation systems. This is the only way to assure that the true needs of the elderly and handicapped will be considered. BART is barrier-free mainly because the handicapped were in on the planning. All facilities in the cars and terminals of this system are designed so that the handicapped in wheelchairs can move freely unaided.

Blind People

Some consumers at the consumer public hearings felt that blind people as a special category of the handicapped should be provided with reduced fares on airplanes and buses as they are on trains since their income is generally low. Blind consumers feel that more attention should be given to enforcement of the "white cane" law and that perhaps education is needed on provisions of the law. One person requested that bus and transit operators be required to call out stops for the benefit of those who are blind or have poor vision since it is impossible to see street signs and know where to disembark. Support was expressed for use of the Braille system at strategic locations to provide guiding signs and travel information for blind people. Also, there was concern expressed regarding the transportation problems of color-blind people. . . .

Government Action

Consumers generally believe that DOT and the Federal government have an obligation to improve transportation facilities and services for the elderly and the handicapped and that there should be cooperation between Federal and state agencies in this regard. Most believe that research and planning should be accelerated to remove travel barriers and that such research should be based, at least in part, upon input from the handicapped and elderly. In addition, there should be better coordination among Federal agencies such as DOT and HUD to insure that adequate transportation facilities are available to Federally funded housing. Consumers expressed the belief that DOT should cooperate more with vocational rehabilitation agencies and the Administration on Aging to meet the specific problems of the handicapped and elderly.

Some support was expressed for DOT to recommend a transportation subdivision of the President's Committee on Employment of the Handicapped and for DOT to have a goal of a sticker from this committee on all transportation modes in all parts of the country. Though consumers concede that there is still need for research, they think the real need is for action to improve transportation for the elderly and handicapped. As for funding, consumers believe that transportation for the elderly and handicapped should have high priority in allocation of Federal subsidies.

Some handicapped consumers at the hearings asked that DOT sponsor legislation to permit the handicapped to deduct all transportation expenses, not just those that are employment related, from their income tax returns. Some believe that special government aid or reimbursement should be provided the disabled in order for them to meet the unusually high transportation expenses they incur. Handicapped consumers, particularly those in wheelchairs, think that because they pay taxes that go to build and support mass transit systems, which they are now generally unable to use, it is only fair for the government to help them meet their exorbitant transportation expenses. They also believe that special transportation services for them should be regulated, since otherwise vendors will raise prices if legislation is passed providing for reimbursement of their transportation expenses. Many consumers believe that there is a need for legislation that would make it mandatory that all public transportation be accessible and usable by the elderly and the handicapped.

Consumers voiced concern that inner city minorities do not have adequate transportation to employment opportunities in the suburbs and that the need for better mass transit within the inner city is acute.

Consumers object to transit plans that are implemented without regard to their effect on minority neighborhoods and are concerned that transit authorities have exploited and ignored the needs of black communities. The transit development plan for St. Louis, some consumers in that area feel, blatantly discriminates against the black community. Similar concern was expressed in Atlanta.

To overcome some of the discriminatory practices, consumers think that DOT should have guidelines requiring representation of blacks on transit agencies funded by the Federal government. In addition, they feel that the Federal government should help black contractors, through training programs and subsidies, to obtain highway and other transportation contracts presently denied them because of their inability to be bonded for lack of sufficient capital and expertise. At the very least, minority contractors, they feel, should be guaranteed equal opportunity in securing transportation contracts. There was support for Federal government assurances, possibly by withholding highway trust funds, for minority inclusion in ownership and in decision-making positions in all transportation-related industries. In Greensboro, North Carolina, it was suggested that the Federal government give financial assistance to privately owned black transit companies, such as Safe Bus which has operated at a loss because of segregation practices in the area.

Consumers are also concerned that DOT demonstration projects are not held in the inner city. They also want public accommodation laws more strictly enforced and applied to non-Federal highways, because they feel that discrimination still exists in public accommodations.

Native Americans

Fort Yates Reservation leaders expressed concern about poor roads and road connections on or near the reservation. They want DOT highway funds to go directly to the reservation rather than to the state so that Indians will be assured of both contracts and job priorities in road building.

Elsewhere, consumers expressed concern about the lack of transportation for Indians and migrant laborers to enable them to take care of their medical, personal, and social needs. In Tuscon, Arizona, there was a consumer complaint that the transit company does not include the Indian reservation in its bus route.

Spanish and Other Non-English Speaking Citizens

Some consumers voiced the opinion that all local transportation planning reports, studies and related materials be printed in Spanish (Chinese was also suggested), so that all people can better understand and participate in transportation planning affecting their neighborhoods.

Mobility for the Disadvantaged*

Requirements of the Legislation

Section 16 of UMTA's legislation states that special efforts shall be made in the planning and design of mass transportation facilities and services so that they can be effectively used by the elderly and the handicapped. This section was amended in 1973 to allow 2 percent of UMTA's total obligations to be set aside exclusively for financing programs and activities to meet the special needs of these groups. As corollary to Section 16, the 1973 Federal-aid Highway Act requires the Secretary of Transportation to assure that transit projects financed under the highway program can be effectively used by elderly and handicapped persons.

The UMTA legislation now permits applications for grants from private nonprofit organizations to provide the required services where the efforts of a public transportation company are found to be unsuitable or insufficient. UMTA will be working with the states to carry out this provision.

Funds from UMTA's capital grant program can be used to provide specially equipped buses and bus shelters, to make rapid transit station improvements, to remove travel barriers, and to improve safety. Technical study funds are available for data collection, analysis of the needs of special user groups, and planning for special services. Research, development, and demonstration funds may be used to do research on the transportation needs of the disadvantaged and to increase the information and technology available for providing improved transportation facilities and services.

The TRANSBUS Program

A particularly challenging objective of the TRANSBUS program (Spring-Summer 1973, p. 4) is the removal of physical travel barriers to the elderly and the handicapped. New design concepts will be tested to provide access to the bus system for an individual in a wheelchair, for example. The final version of each of the three prototype designs will feature a different approach to this design problem.

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*Taken from *Highway and Urban Mass Transportation* (September, 1974).

The Haddonfield, New Jersey, Dial-A-Ride

Both the scope and concept of the demand-activated transportation system is being demonstrated within an eight-square-mile area in Haddonfield, New Jersey, with door-to-door Dial-A-Ride. Twelve small buses, designed for maximum comfort, are radio dispatched in quick response to called-in requests for service. The Haddonfield community is now enjoying transportation that can go anywhere on any city street; has high security against crime; provides door-to-door service 24 hours a day, seven days a week; and supplements the inflexible rapid transit system in meeting both peak and off-peak requirements.

Although Dial-A-Ride has appealed to the public generally, elderly and handicapped people, housewives, and young people have found it particularly inviting, because it gives them a new mobility, decreasing their dependence on friends or the family car. One of the buses is specially fitted to accommodate wheelchair passengers and those with other handicaps that prevent them from using standard public transportation.

Service Development Demonstrations

UMTA's service development program is a demonstration program specifically concerned with the problems of the transportation disadvantaged. It is designed to develop and try out, in cooperation with local communities, innovative types of transportation service for persons with mobility constraints arising from age, economic status, or physical disability.

Projects range from special circulation systems in the inner cities of large metropolitan areas to services in small towns or suburban areas. Each demonstration results in a detailed final report for use by other communities interested in setting up similar systems. Although the demonstration program is young, significant results are already being achieved. Five examples of UMTA's service development demonstrations for the handicapped and elderly are described below.

The Valley Transit Demonstration Project. In the Lower Naugatuck Valley, Connecticut, six bright green and blue minibuses are proving to be indispensible to nondriving residents of four adjacent communities. The buses are part of the Valley Transit project, designed to develop a successful public transit operation by concentrating initially on the needs of health and social service agencies and other clients. Making the service completely accessible to elderly and handicapped persons was a major consideration in planning this project.

The unique system has the flexibility to provide three types of service: door-to-door by telephone request a day in advance; rent-a-bus reserved for exclusive group use; and regular fixed routes.

The modern, carpeted buses contain the latest in safety and comfort features, including added support stanchions as well as a low front step and wide doorway for easy entry. One of the six vehicles has an electrohydraulic lift on the side, enabling persons in wheelchairs to enter easily.

The Valley Transit Demonstration Project is the first in the country to design and test a new concept in automated fare collection using credit cards. A passenger getting on or off the bus simply inserts the card into a special recorder. He then receives a monthly bill according to the type and amount of service received at the rates indicated in the fare structure. This computerized billing system also permits cost sharing between clients and agencies that have agreed to pay for a portion of their clients' trips.

The demand for dial-a-ride and rent-a-bus service has been so great that the Valley Transit District is taking action to more than double the size of its fleet. More than 20 health and social service agencies are using the service. System revenues are covering more than 70 percent of the operating costs.

A School Bus Demonstration in Klamath Falls, Oregon. Klamath Falls, Oregon, is a community of about 32,000, that had no public transportation and a high proportion of elderly. A vocal senior citizens group convinced UMTA and the Oregon State DOT that their city was the best place to conduct a pilot project testing the feasibility of using school buses during idle hours to provide the beginning of a community transportation system. In spite of long headways and the absence of service when the buses were transporting children to and from school, the response to the first limited service was overwhelming. Full service, developed during the summer months, further demonstrated the need for regular transit service. The community is deciding on the next step: conversion to regular transit vehicles or a school bus system supplemented by transit vehicles.

A Model Cities Demonstration. An UMTA demonstration grant to the Grand Rapids Transit Authority in Michigan has provided for a demand-responsive transportation system for the Model Cities neighborhood, a low-income area with a large percentage of autoless households. Five small buses operate from 6 a.m. to 1 a.m., transporting residents to senior citizen centers, daycare centers, health and social service agencies, places of employment, and other destinations. Passengers may go anywhere in the city so long as one end of the trip is in the model neighborhood. Transfers are available to regular city buses.

The regular fare is 50¢, but senior citizens pay 25¢ per trip, and children with their parents may ride free. A Model Neighborhood Advisory Council, composed of residents, insures that consumers have a voice in the operation and that it meets their needs.

TOTE in St. Petersburg, Florida. The TOTE logo is becoming a familiar sight on the streets of St. Petersburg, Florida. The acronym represents "Transportation of the Elderly," a demonstration assisted by an UMTA service development grant to determine the capability of an extensive door-to-door service to operate in harmony with a major fixed-route municipal transit system. The project area is ten square miles containing the central business district of St. Petersburg. The large majority of the area residents are older persons.

After registering with TOTE, handicapped persons and those over 60 years old may use several types of special service: a reservation system where a person calls 24 hours in advance and specifies the time he wishes to be picked up and returned; a subscription procedure through which a person can make a continuing arrangement to be picked up on the same day at the same time every week until he notifies TOTE to stop or change the service; a higher-priced same-day service available on a limited basis; and a rent-a-bus service for groups during the evening and on weekends. Drivers of the 12 van-sized vehicles being used in the operation have been specially trained to be sensitive to the particular needs of the elderly.

Transvan for Cranston's Elderly. The aged, the infirm, and the handicapped now have their own transit system in Cranston, Rhode Island, because of an UMTA demonstration grant. Three 19-passenger buses--one equipped to lift and carry four wheelchairs--provide door-to-door, demand-responsive service for the elderly and handicapped. Certain regular runs are made to medical and other commonly needed facilities, but customized trips are readily arranged by making a date by phone one day in advance. This successful service has now reached the point where there are more requests than can be scheduled in an eight-hour day with Transvan's three buses. In a year and a half, Cranston's unique system has grown to the point where it is serving over 800 elderly and handicapped citizens each week. Use of the system is on a subscription basis, with a three-month pass selling for $1.25, with both insuring unlimited service.

ACTIVITY #10

Mini-unit Topic: Identifying Public Transportation Problems

Approximate Class Time: 2-4 periods, plus out-of-class time

Capsule Activity Description: Students investigate why public transportation service in many communities in inadequate.

Goal:

To know why public transportation service in many American communities is often inadequate.

Concepts Treated:

- There are several historical causes of the lack of adequate public transportation in some U.S. communities.
- Rural communities in particular tend to lack adequate (or any) public transportation.
- Students need to understand the causes of inadequate public transportation in order to evaluate effectively the extent to which public transportation can and should be provided in America's cities, suburbs, and rural communities.

ACTIVITY

In this activity, students investigate what historical factors have resulted in the development of inadequate public transportation in many communities. Students can then identify ways in which to overcome these obstacles in the future.

Students as a class or in small groups can conduct the research in a variety of ways, including interviews with public transportation and other city or town officials; interviews with specialists (e.g., historians, political scientists) in the field of transportation or urban studies; visits to local historical societies and libraries; culling back files of local newspapers; and looking for articles listed in the *Readers' Guide to Periodical Literature* and the *New York Times Index*. Students may find it helpful to read several of the bibliography items at the end of this chapter to get an overview of the problems and to develop a list of questions they would like their research to answer. Some possible explanations for the inadequacy of public transportation which students can research follow:

- To what extent is it difficult to provide adequate service because lack of ridership results in insufficient revenues?
- Are there ways in which the public interferes with improved service because of its lack of consideration in how it uses or abuses public transportation?
- Do political considerations play a large role in restricting the improvement or expansion of service?
- Has the dispersed settlement of our nation's suburbs made it difficult and expensive to service the needs of commuters?
- Has public transportation in rural areas been neglected because it cannot be expected to generate much revenue from passenger fares?
- Has the government's major focus on highway construction been a reflection primarily of the apparent preference of most citizens for automobile travel?
- Has the limit in the money available made it impossible to fund both highways and public transportation adequately at the same time?

If the class breaks into small groups to conduct its research, one group can focus on the problems of rural transportation and of ways to solve them. Rural dwellers are largely without public transportation service and therefore dependent on automobiles for most of their travel needs. However, many rural dwellers do not own automobiles and consequently find some of their travel needs unmet. Citizens need to consider what (not prohibitively expensive) solutions exist for meeting the needs of rural dwellers. Two partial solutions to the lack of public transportation in rural areas may be carpooling and other means of making more efficient use of the automobile, such as trip consolidation.

Students from nonrural areas who engage in this activity can compare what common sense and their own research indicate are the problems of travel in rural areas with what rural dwellers have themselves indicated these problems are by studying the first two readings following the activity. Rural students who engage in this activity can see if their personal travel problems are shared by other rural dwellers.

Finally, students should identify possible solutions to the lack of convenient, inexpensive public transportation in rural areas. You can supplement your students' suggestions by duplicating the third selection at the end of the activity taken from *Transportation and the Rural Community* and passing copies out to the class or by presenting the selection's major points to the class in the form of a lecture. Students can discuss each of the suggested solutions in terms of effectiveness, costs, and adequacy.

Evaluation Method:

Students develop a plan to improve one aspect of public transportation in their own community and present the plan to local transportation officials for discussion.

Variations and Supplementary Activities:

Students can discuss whether the government should subsidize public transportation in rural areas and, if so, whether these funds should come from general tax revenues or from other sources.

Students can compare rural and suburban transportation problems and discuss similarities, differences, and possible solutions for each.

Rural Transportation *

The generally accepted public view is that rural America travels by automobile, but studies indicate that as many as one person out of five in rural areas does not own a car and in impoverished areas the carless can run as high as two out of five. Lack of mobility also adversely affects the handicapped young people who are not old enough to drive, and women in one-car families. The fact is that 52 percent of the nation's poor and nearly one-half of the elderly live in non-urbanized areas of less than 50,000.

Public transportation in rural areas, whether for the general public or special groups, uses such unconventional vehicles as small vans, local taxis and school buses. Instead of fixed routes the service may be demand responsive to a person's call in advance. Most systems in rural areas operate to serve special needs or special population groups.

Rural residents who lack personal transportation may have a great need for community and health services but often rural hospitals and facilities--such as the offices administering Social Security--are located in urban centers and small towns long distances from many rural people. Such a transportation-disadvantaged person may pay $20 or more for a ride to a health or welfare office.

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*U.S. Department of Transportation News Release.

Consumer Views on Rural Transportation*

Consumers in urban as well as rural areas voiced strong concern about the lack of adequate transportation for people living in rural areas of the country, many of whom have neither access to public transportation nor, because of their low income, use of an automobile. This problem is particularly acute for the elderly, the sick, and the handicapped, who have no means of getting to medical and other services.

This isolation caused by lack of transportation not only makes it difficult for residents to avail themselves of shopping, medical and recreational services and facilities, and seeing their friends and relatives, but it further compounds their already pressing economic problems by denying them essential job opportunities. There is a lack of industry in the immediate area caused, in part, by a lack of adequate rail service.

Consumers recognize that because of limited ridership and larger geographic areas to cover, the cost of public transportation in rural areas is unusually high and the system would undoubtedly be unprofitable, but they also feel that the need is still acute. Consequently, they advocate Federally funded public rural transportation systems, possibly coordinated between DOT and HEW.

Additional suggestions ranged from using school buses when they are not carrying children to use of nearby military buses when not otherwise being used to the development of a government-funded dial-a-bus system or other personalized service. One consumer even suggested permitting rural mail carriers to carry passengers.

Additionally, consumers see a need for intercity buses to include more rural communities on their routes, but this must be accompanied by some form of local public transit to permit the traveler to get from the rural town to his rural destination.

Those rural residents who do have automobiles have to put up with a generally poor road system. They feel they take second place to urban and suburban areas in allocation of highway funds, primarily because of political considerations. They want repairs made to county and city roads and rural roads widened to be more useful. As stated by a student at the University of Tennessee: "The Department of Transportation, in its concern for rural transportation, should look into the poor condition of many county roads. It should enforce strict requirements and regulations on state and county governments to provide safe roads where school buses and postal vehicles travel. Roads are narrow, have soft shoulders, are obscured by tree limbs, brush, rotten wooden bridges, etc. Such conditions could easily lead to a disaster where 38 or 40 children's lives may be at stake. Again, with the help of HEW or subsidies, this kind of program should be initiated wherever the above described conditions exist..."

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*_The Voice of the Transportation Consumer_, A Report to the Secretary of Transportation on Nationwide Consumer Public Hearings Conducted by the Office of Consumer Affairs, 1971-74, Executive Summary (National Technical Information Service: Springfield, Virginia), pages 44-45.

Since many rural residents have low incomes, they are especially hurt by the rise in gasoline prices, which, in turn, makes public transportation necessary for even residents with automobiles.

Transportation and the Rural Community*

Recommendations for Action

Workshop suggestions concerning other aspects of rural transportation focused on these topics: planning and marketing transportation services, demonstrations and how to learn from them, and ways in which institutional barriers might be reduced or removed. In these concerns of the workshop, as elsewhere in the discussion, there was an unresolved and little explored difference of opinion: whether change should be introduced as part of a national policy or strategy for rural transportation, or if local initiative and local decision making should be stressed.

Effective rural transportation planning will need to be totally different in scope and technique from that characteristic of urban areas. Without concentrated population and economic activity to support massive volumes of goods and people, rural areas' transportation needs are harder to identify and meet. One reason is that some of the groups with the greatest transportation needs--those without ready access to private automobiles or in the most remote areas--are the least visible.

> *Salzman:* [For rural areas] you can't do a traditional operations research transportation model. You have to get a very "micro" level. It's "public" transportation but it sure isn't "mass."

> *Johnson:* The right first step is to develop real data on demand and need. This implies a new style of planning--not building a model with a fixed route, but letting routes and frequencies of services be determined by patterns of actual transportation behavior.

Separate rural transportation services must not be designed to serve each individual subgroup in the population. The market needs to be combined by determining the total demand implied by many different kinds of transportation needs in the area and then setting up services flexible enough to accommodate these different kinds of transportation requirements. To some extent, if the service is reliable, comfortable, and not too expensive, people will adjust the timing and purposes of trips to fit the system and thus will, in effect, combine themselves. Johnson offered examples of the different kinds of transportation needs that were taken into account in planning one such rural service:

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*Recommendations by transportation experts as described in the *Report on the First Workshop on National Transportation Problems,* May 30-31, 1974, U.S. Department of Transportation, Office of the Secretary, Office of University Research, Washington, D.C. 20590.

- Trips to obtain monthly certification for food stamps need to be staggered through the month by the dispensing agency or else be accomplished by mail. Otherwise those who have to establish their eligibility will overwhelm the office on renewal day and have to make another trip later when they can be accommodated.

- Health services imply different kinds of transportation requirements for different age groups. Infants have an immunization program, with perhaps three trips in three months; school-age children have regular series of periodic examinations and preventive services; older people have varying treatment programs depending on the specific ailment.

- Shopping in larger towns on a weekly or less frequent basis is a longstanding custom for many rural area residents. If the transportation system does not conform to these shopping habits by taking people to and from the shopping area they are accustomed to, the service may not be used even if it costs little and runs at convenient times.

But although each subgroup in a rural population has its special transportation requirements, it is not cost-effective or particularly helpful to provide separate services for each kind of travel requirement. The workshop participants stressed the desirability of creating or maintaining services capable of meeting simultaneously a variety of transportation needs (e.g., work trips, shopping, public assistance, health care). One demonstration in Oregon funded by the Urban Mass Transportation Administration is testing the use of school buses for meeting a variety of rural transportation needs in addition to the movements of schoolchildren.

Having a service available to all comers is also important in avoiding having the users stereotyped as an inferior group. For example, a rural bus used largely by people who must register for food stamps or obtain welfare services may be avoided by other potential riders who need the service just as much for shopping or health-care appointments but whose pride makes them want to avoid being labeled as "welfare bus" riders. Therefore what efforts are made to diversify the user group and what kinds of promotional techniques are used to build ridership can make a big difference in how many and what kinds of people become steady riders.

At present, because of tradition and regulatory restraints, there is a lot of underused transportation capacity (for both people and things) in rural areas. A large number of single-purpose vehicles--for mail delivery, newspaper delivery, package delivery, utilities service, equipment service, school transportation, library service, road patrol or repair--pass by most rural homes in the course of a single day. The workshop discussion suggested that this characteristic of rural transportation might be one place to look in seeking innovations that can make better use of existing transportation resources.

If rural transportation, either for people or for goods movement, cannot be made self-supporting through the fares and freight charges, what should be done? Operating subsidies recently allowed by several Federal transportation programs will be a necessary part of the effort for rural transportation improvement. Subsidy makes sense when greater costs would be incurred by the community or by other public programs if the subsidy were not helping to maintain a needed transportation service. The same principle applies to maintaining privately operated services, such as rail or truck lines that would otherwise be abandoned. These special measures are forms of subsidization. "Subsidy is not a four-letter word," as a participant pointed out; it is clear that some essential services cannot and should not be required to pay for themselves.

Currently, one mechanism for Federal subsidy of rural transportation on a limited scale is through "rural transportation demonstrations." This topic was addressed by Keven E. Heanue in his workshop presentation.

> The nation has 3.9 million miles of roads, 900,000 of which are eligible for some form of Federal assistance; 3.1 million miles are outside urban areas. The annual Federal highway expenditure of $4.4 billion (out of $20 to $25 billion annual expenditures nationally for new highway construction and maintenance of the system) is through programs largely under the control of the states. The Federal efforts in highways and public transportation are becoming more closely related, as for example in the 1973 Highway Act, with funds under certain conditions being available either for highways or mass transit development. There is an even closer working relationship between UMTA and FHWA, leading some to forecast that within three to five years there will be a single agency within the Federal government for ground transportation.
>
> Rural demonstration program provisions were an important feature of the 1973 Act. Emphasis will be on using transportation for improving access to employment, health care, social, and recreational services in rural areas. Features of this program are:
>
> - The demonstrations are for areas including communities of 5000 persons or less.
>
> - Applicants may be public agencies, nonprofit organizations, public agencies that contract to private operators, or Indian tribes.
>
> - Some portion of the grant can be for operating subsidy but only if the service to be tried is a new one or an innovative addition to an existing system.
>
> - Evaluation criteria for the demonstration proposals will include potential applicability of the innovation elsewhere; the probability of success; the amount and kind of state and local commitment (financial and technical); the plausibility of the estimates of

demand for the proposed service; benefits of the proposed service to the elderly, the handicapped, and other disadvantaged groups; the availability of the service to a variety of types of users; management capability; and suitability of proposed promotional techniques.

While up to 100 percent of the support for such demonstrations can be Federal, preference would be likely to be given to proposals that include some combination of Federal and other support. The proposals will be reviewed by the Department of Transportation in the state concerned, the regional office of the U.S. Department of Transportation, an interagency Federal evaluation team, and the FHWA. Perhaps ten to 20 demonstration grants will be awarded in fiscal year 1975.

Innovative Alternatives

Though new technology was deemphasized, even warned against, in the workshop, there were specific suggestions that came out of the discussion:

- More can be done in a combined freight-passenger railcar and its highway counterpart; rural areas of France and western Canada have such service. Yet there is no appropriate vehicle here, nor has DOT ever undertaken research and development in this area.
- Contracting with private automobile owners for some kinds of community transportation services. These might be paid for with some type of scrip--"transportation stamps"--analogous to food stamps or coupons.
- Possible subsidizing of transportation by shopping centers, medical groups, or other organizations whose customers or clientele are widely dispersed in a surrounding area.
- Providing a "transportation broker" (as in a current project at the University of Tennessee) who can match travel needs with a variety of transportation services in rural areas.
- Use of rural mail carriers, school bus drivers, county agents, and others already traveling rural routes for information on transportation needs and potential demand.
- More extended use of mobile units to take services to people rather than bring people to services.
- Fixing of passenger service routes in rural areas only after a test period at no cost or minimal cost in which careful records are kept of the actual travel behavior of people in the area, rather than

basing system planning on surveys of what people intend or believe their travel requirements would be if service were installed.

Some of those at the workshop argued for a national strategy for rural development as a way to guide the allocation of resources and improve the national transportation system. Others took the view that local areas and states should determine priorities and describe needs, with rural transportation as in other matters of public policy, and that the Federal government should then "respond accordingly" with its participation in meeting that need.

The "national policy" advocates stressed the importance of making coherent long-range decisions to maximize benefits. Those strong for local initiative put more value on decentralized decision making and community participation.

ACTIVITY #11

Mini-unit Topic: Identifying Public Transportation Problems

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students learn how greater use of public transportation can be stimulated by regulating the commuting behavior of the public.

Goal:

To be aware of how changing the commuting behavior of the public may reduce congestion on public transportation vehicles during rush hour.

Concepts Treated:

- A major feature of public transportation that alienates many existing riders and drives away potential riders is overcrowding during rush hour.
- Overcrowding during rush hour on public transportation vehicles might be alleviated if industry altered its working hours for employees.
- Scarce energy resources can be conserved if the public's commuting habits shift toward using public transportation.
- The public needs to be aware of the attitudes many people have toward public transportation in order to decide whether the government should provide public transportation that more people are willing to use.

ACTIVITY

Seventy-seven percent of the nation's work force travels to work every day by private automobile. One reason many of these people do not use public transportation is the overcrowded condition of many buses, subways, and commuter trains during rush hours. In this activity, students explore ways in which the demand for public transportation services can be reduced during rush hour times of peak ridership by changing the hours people go to work. In this manner, if more people are willing to use less crowded public transportation systems for travel to and from work over a spaced out rush "hour" period, considerable savings of scarce energy resources can be realized as gasoline consumption for private automobiles declines.

Students begin the activity by writing their responses to the following scenario, which you can adapt to reflect the local transportation situation:

> You have just been appointed transportation commissioner for your community. One of your major concerns is to increase the use of public transportation so that energy resources can be conserved as people use their automobiles less and patronize public transit more. However, you are aware that one reason some people prefer using their cars to using public transportation to go to work every day is the overcrowding on the buses (trains, etc.) during the morning and evening rush hours. You want to eliminate or reduce this rush hour "crunch."
>
> You are limited in what you can do, however, to reduce this overcrowding: you have no money with which to improve public transportation, and you cannot buy new buses (trains, etc.) or hire more people to run them more often. What you *can* do, however, is to try to change the *time* when people go to and from work so that no everybody leaves for work between 7:30 and 8:30 in the morning and leaves for home at 5:00 every evening. There are three ways this could be done:
>
> 1. Companies could change their hours so that some (or all) of their workers must show up at work later or earlier than usual and go home before or after 5:00 P.M.
>
> 2. Companies could allow their workers to come to work any reasonable hour they want and leave anytime between 3:00 and 7:00 P.M., as long as they put in an eight-hour day.
>
> 3. Companies could switch to a four-day week, with some workers taking off Mondays and others Fridays (or even days in the middle of the week).
>
> You cannot force businesses to do any of these things, but the mayor (town council) has said he would personally encourage industry to go along with your proposals by pointing out the advantages such changes would have *for them*, as well as for their employees, and by reducing taxes on companies willing to cooperate. The mayor (town council, etc.) is waiting for your ideas on what to do. What will you tell him he should ask businesses to do? How will you defend your proposals?

After they have written their responses, break the students into small groups. You can group students in one of two ways: have each group composed of students who advocated different types of solutions (staggered work schedules, flexible hours, shortened work week) or group the students homogeneously so that each group has students who advocated the same course of action businesses should take. In the former method, each group must reach a consensus on what single course of action or combination of actions would be best; in the latter method, each group refines its particular solution and then presents it to the class. Discussion follows on which group's plan is better and why.

After the discussion, have the class analyze whether any of the group's plans are feasible alternatives for the local community, and if not, why not. As part of this analysis, the class should consider how people--including themselves--would feel about coming to and leaving work early or late or working a four-day week. Do members of the class feel people, such as themselves, would use public transportation more if it were less crowded than it now is during rush hour?

After the activity, the class can consider how other communities have implemented these three approaches to reducing rush hour traffic congestion and thereby increasing use of public transportation and conserving energy resources. You can either duplicate and distribute the following pages which describe such programs or describe these programs to the class yourself.

Evaluation Method:

Students interview community residents or business officials, asking them for their opinions about the utility of each of the three proposed solutions to rush hour traffic congestion and conserving energy resources.

Variations and Supplementary Activities:

Students can seek to implement one of the three programs in a small business or agency.

Students can research or discuss the extent to which the need for automobiles can be reduced by planning housing developments accessible to work places and by developing residential neighborhoods near shopping and recreational areas.

Students can invite to class officials or employees of a business that has adopted one of these plans to reduce rush hour crowding to describe how the program works and what effects it has had on the company and its employees. If no such program exists in the community, students can invite officials of a business to discuss their feelings about instituting such a program.

Adjusting the Demand for Transportation Services and Facilities*

A back door approach to improved urban mobility rests on reducing or modifying travel behavior. If people have little or no need to make a trip by automobile or transit in order to go to work, to shop, to school, or for entertainment, there would be a corresponding drop in the demand for more and better transit services, for more parking lots, for more roads. Success in cutting this transportation demand will take long-range efforts and involve fundamental changes in land-use planning. In the meantime, however, some changes can be instituted that can adjust the demand for transportation facilities so that urban mobility can be improved.

Staggered Work Schedules

To meet the peak-hour demand, transportation officials have generally concentrated on increasing the size of the vehicle fleets and increasing street capacity. However, in most metropolitan areas increasing street physical capacity much beyond what it is at present is no longer an economically or environmentally practical alternative. Adding more buses to the fleets will help substantially, but this is costly and may even compound the "peaking" problem.

Some relief for the rush hour crunch may also lie in the technique of staggered working hours. Programs that stagger employee arrival and departure times try to spread out the peak hours, to smooth out the difference between peak and nonpeak and thus ease the flow of people into and out of the central city. Extending the peak-hour demand over a longer period of the working day spreads out the demand and permits more efficient use of street space and transit vehicles.

There are several alternative methods of staggering work hours. The traditional 9-to-5 work day can be adjusted to stagger employee arrival and departure times over a short time period. Four years ago, New York City launched a campaign to shift people working in lower Manhattan out of the 9-to-5 pattern. Today, the expanded program is credited with switching more than 200,000 employees in 400 Manhattan firms to staggered hours that permit them to travel to and from lower and mid-town Manhattan during off-peak hours. Most of the participating companies chose an 8:30-to-4:30 schedule, some an 8-to-4, and others a 9:30-to-5:30. These three new schedules extended the peak period from 8 to 9:30 in the morning and from 4 to 5:30 in the afternoon. The transit systems, the road systems, and the people are all benefiting from the plan. Among employees, the plan has an 85 percent approval rating; employers

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*Taken from Barbara K. Reichart, *Improving Urban Mobility through Better Transportation Management* (U.S. Department of Transportation: Washington, D.C., 1975).

credit it with increased employee punctuality (resulting from increased transit punctuality) and reduced elevator congestion; and transit managers credit the plan with a 26 percent cut in the size of the rush hour crush at neighboring subway stations and a corresponding increase in passenger trips during the previously underutilized periods.

In Philadelphia, a program that began in 1970 as a test project at Smith, Kline and French Pharmaceutical Laboratories switched 57 percent of the 2900 employees from the 8-to-4 peak schedule to an 8:45-to-4:30 schedule (with a 45-minute lunch period). The staggered hours program has now grown to involve more than 32,000 people working in the center city. Certain types of businesses have adopted the late-hour schedule quite naturally. Department stores in Philadelphia not only serve their customers more conveniently but also contribute to the staggered hours program by following a later-opening/later-closing pattern.

The Chamber of Commerce and the Delaware Valley Regional Planning Commission are aiming at a goal of 50,000 participants. At that level of participation, evening rush hour loading on the major east-west subway and elevated are expected to drop by at least 15 percent, giving passengers more reliable and more comfortable service. A similar 15 percent shift in demand period passenger trips is predicted for the Lindenwold high-speed line linking Philadelphia to New Jersey communities across the Delaware River.

At least eight other major cities are also implementing types of staggered working hours. Since 1970, 50,000 employees in six Federal departments in Washington, D.C. have been arriving at their offices in 15-minute intervals from 7 A.M. to 9 A.M. with corresponding staggered departure times. State and local governments have taken the lead in setting up a staggered work schedule for their employees in Albany, New York; Raleigh, North Carolina; and Inglewood, California. Several companies have also launched staggered-hour programs on their own to help employees avoid traffic snarls and improve punctuality.

"Gliding" or Flexible Hours

Staggered working hours can also take the form of flexible hours--also called flextime, gleittzeit, or gliding hours. This generally consists of a prescribed block of time during which all employees in an organization must be present while allowing employees to select their own starting and quitting schedules to fit their individual needs and preferences. This enables employees to take advantage of carpooling and other ride-sharing opportunities and scheduled public transit services. In a regulation recently published by the General Services Administration of the Federal government, all Federal agency supervisors were reminded of their prerogative to adjust the schedule of an employee to facilitate carpooling and the use of mass transit.

In an eight-hour working day, some employees could opt for an early-arrival schedule of 7 A.M. to 3 P.M. which offers particular benefits to those who desire to do errands or to be home earlier in the afternoon. Others may find a later-arrival pattern more suitable. In occupations that permit a large degree of independent activity and do not require immediate communications with other areas (such as some types of industrial processing, data processing, etc.), better use of Saturdays as working days could be made for those employees preferring a Sunday-to-Monday "weekend."

All these methods try to stagger the working hours within the traditional five-day work week. Another option available to adjust the demand for transportation facilities is the shortened work week.

Shortened Work Week

There are two general types of shortened work week programs. One type, the "reduced" work week, actually reduces the total number of hours worked each week. The "compressed" work week retains the same number of hours per week but condenses them into fewer days. For example, a 40-hour work week can take the form of a four-day, ten-hour-day schedule instead of the familiar five-day, eight-hour-day routine.

In theory, if the four-day work week were adopted by the entire working population in a given metropolitan area and the extra day off was evenly distributed from Monday to Friday, the demand for transportation services and facilities to serve commuters could be reduced by 20 percent since only 80 percent of the entire work force would be reporting to work on any given day. If the extra day off were to be distributed over six days, there would be a theoretical reduction in demand of 33-1/3 percent.

Another easing of demand could be gained by staggering the starting and quitting times within the ten-hour day. Fifteen-minute intervals extending over 1½ hours in the morning and again in the evening would level the demand for transportation services and facilities to more manageable loads, instead of trying to accommodate all the travelers simultaneously.

Some 600 firms in the United States have put into practice some version of the four-day work week for at least some of their employees where such a system was compatible with the interests of both the company and its employees. These occasional instances of four-day work weeks contribute to leveling transportation demand.

Before any large scale commitment to a four-day (or three-day) work week is made, certain questions remain to be answered. What are its impacts on the viability of public transit systems? For what types of employment activities can a staggered work week program be effective? What are the effects of such a program in terms of production costs, including energy consumption? What is the effect on employee well-being? What do employees do with the extra day off? What are the impacts on carpooling programs and other national energy conservation programs, on land use? Are they harmonious?

A well-intentioned staggered work week program could have unintended negative consequences. For example, a staggered work week program could seriously jeopardize ride-sharing programs and public transit service if it encouraged--by reducing street congestion--more people to drive private automobiles to work. Another negative effect could occur if the program, designed in part to conserve fuel resources by reducing the number of home-to-work trips an employee must make per week, resulted in the extra time off being spent driving the private automobile for recreational or pleasure purposes.

What this suggests is that any program aimed at shifting the work pattern of a number of people must pay careful attention to all possible consequences and try to find a proper balance.

MINI-UNIT 4

WHO CAN EFFECT IMPROVEMENT OF PUBLIC TRANSPORTATION?

This mini-unit focuses on *who* is responsible for changes in public transportation, *how* changes are effected, and the *difficulties* involved in trying to improve public transportation service.

A critical issue on which several of the activities focus is the political and administrative process by which transportation decisions are made by largely autonomous local transit authorities and by the Federal and state governments. Whether and how citizens can participate in the decisions of these powerful groups must be addressed if the public is to have an impact in this major area of public policy.

The unit is predicated on the following assumptions:

1. Citizens have a responsibility to be aware of transportation inadequacies in their own communities.
2. Citizens should learn what opportunities are available for them to participate in transportation decision making in their own communities.
3. Citizens must sometimes take the initiative in recommending changes in transportation services in their own communities.

Other important concepts this unit treats follow:

- Consumers need to decide for themselves which inadequacies in public transportation service warrant seeking redress of grievances.
- Complaints to public transit authorities should be sufficiently detailed to permit proper investigation by transit authorities.
- Public transit authorities may not be responsive to the needs of the public unless citizens participate in the decision-making process of these agencies.
- Many constraints make it difficult to improve public transportation.
- A major constraint to improving public transportation lies in funding problems.
- There are often ways in which the public can participate effectively in the decision-making process of public transportation authorities.

You can also consider using Activity 4 as part of this unit, since it focuses on funding actions being taken by the Federal government to improve and promote public transportation.

Once again, these activities are important for students to engage in even if there is no public transportation in their community. If that is the case, most of the activities can be conducted in terms of *providing* public transportation service rather than in terms of expanding or improving it. Furthermore, some students may move to communities that do have public transportation service, and these pupils will need to have information and skills to secure adequate public transportation service in their new place of residence.

MINI-UNIT 4 LESSON PLAN

Who can effect improvement of public transportation?

Activity #	*Activities*	*Class Time*
12	DESCRIPTION: Students research the structure, powers, and decision-making process of public transportation authorities. GOAL: To know how public transportation authorities make their decisions.	2-3 periods, plus out-of-class time
13	DESCRIPTION: Students learn how to seek redress of grievances against unsatisfactory public transportation service. GOAL: To know when and how to register complaints against unsatisfactory public transportation service.	2-4 periods, plus out-of class time
14	DESCRIPTION: Students interview public transportation system employees and administrators to learn what constraints may make it difficult or impossible to improve service. GOAL: To know what constraints make it difficult to improve public transportation service.	1-2 periods, plus out-of class time
15 Spirit Master #2	DESCRIPTION: Students research methods of citizen participation designed to promote public transportation. GOAL: To know how, with certain constraints, public transportation can be improved through citizen participation.	2-3 periods, plus out-of class time

Total Class
Time: 7-12
Periods

ACTIVITY #12

Mini-unit Topic: Improving Public Transportation

Approximate Class Time: 2-3 periods, plus out-of-class time

Capsule Activity Description: Students research the structure, powers, and decision-making process of public transportation authorities.

Goal:

To know how public transportation authorities make their decisions.

Concepts Treated:

- Public transportation authorities may make decisions affecting the public without effective citizen involvement in the decision-making process.
- Public transportation authorities may not be responsive to the needs of the public unless citizens participate in these agencies' decision-making processes.
- There are often ways in which the public can participate effectively in public transportation authorities' decision-making processes.

ACTIVITY

Break the class into small groups. If your community has more than one mode of public transportation, each mode should be covered by at least one group. If students live in a community with only one mode of public transportation, the entire class can research the same authority. If no public transportation is available, students can discuss the feasibility of it with local officials.

Students research three areas of study:

General Powers and Decision-making Processes of Each Authority. On this topic students can seek answers to the following questions:*

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*For a discussion of citizen participation in transportation planning, see the reading at the end of Activity 15 and the Bibliography entries.

- Who serves on the authority? How are these persons appointed or elected? How long do they serve?

- What are the motives of people who serve on public transportation authorities? What is the compensation? Are there other rewards such service can provide, such as political advancement, furtherance of personal ideals, publicity?

- What are the powers of the authority or agency? Specifically, what can it do and what can it not do? Who funds the authority?

- Who oversees the authority's actions? To whom is it responsible? Do people or agencies which have responsibility for overseeing the authority's actions exercise that power at all or effectively?

- How does the authority make its decisions? Who is able to exert influence over its decisions--unions? citizens? politicians? pressure groups?

- What provisions does the authority provide for citizen participation?

Decision-making Process for a Concrete Action the Authority Has Taken. Each group picks an important recent decision made by "its" authority and researches how the authority arrived at that decision. Examples of important recent actions many public transportation authorities have taken include:

- Installation of exact fare system (operator does not make change)

- Discontinuation of service in a part of the community or extension of service to a section of the community

- Purchase of a new type of vehicle

- Change in fares

- Installation of special fare system for children and/or the elderly

In particular, students research the role the public transportation system's employees play in the decision-making process. For example, to what extent has the installation of the exact fare system in many communities resulted from employees concerned about robberies?

Students also focus on the extent to which public transportation authorities make decisions with a view to Federal funding possibilities and to comply the Federal transportation regulations.

Finally, students seek to learn whether there is an effective method by which the public can participate in the decisions of public transportation authorities.

Improvements in Public Transportation. Improvements the authority would like to implement, is considering implementing, or has already implemented, which are designed to improve public transportation in the community and increase ridership, are examined. Students should first investigate whether the transit authority has a citizens' advisory committee that can make recommendations concerning needed changes in the community's public transportation or if there is provision for such recommendations to come directly from the public. If so, students can ask what changes have been recommended--such as those suggested in the first reading provided at the end of this activity on "Improving Urban Mobility."

Whether the transit authorities have considered these changes or not, students research the answers to the following questions:

- Which of the improvements presented would be useful in the students' community?

- Which would be feasible to have introduced?

- Who is liable to oppose their introduction and why?

- What parts of the community would benefit from the changes? Would any sections of the community be harmed?

- Is it appropriate to encourage people to use public transportation by reorganizing the environment so that, for example, buses can travel faster than cars?

Students can also poll the community to ascertain public sentiment concerning changes that may have been recommended within their own community; changes discussed in the first reading, "Improving Urban Mobility," at the end of this activity; and other changes the students consider worth consideration.

Students conduct their research by interviewing public transportation officials and other employees (including vehicle operators), reading back issues of local newspapers, and, where possible, reading articles and books.

After conducting research, groups prepare and present a report to the class which concentrates on the extent to which the public is effectively barred or involved in the decision-making process of the public transportation authorities they studied. Students compare their conclusions with the complaints transportation consumers made at a series of national hearings on transportation. These complaints are summarized in the second reading provided at the end of this activity.

Students should also analyze how they personally, as taxpayers, commuters, and users and purchasers of transportation goods and services would like to be involved in decisions related to transportation in their community and how they can become involved (see Activity 15). Students should be aware in this connection that, under U.S. Department of Transportation regulations, before any locality may receive Federal funds for a public transportation project (or a highway project), it must provide for citizens to participate in the decision-making process.

Students interviewing local officials should ask how the locality complies with these Department of Transportation regulations.*

Evaluation Method:

Each group writes a letter to the editor of a local paper explaining how the public transportation authority reached the decision researched by the group and describing how the public was or was not involved in the decision-making process. Letters should stress whether there are opportunities for public participation, whether citizens use these opportunities, and whether the process for citizen involvement should be changed to increase citizen participation.

Variations and Supplementary Activities:

Students can interview the public on its views about how public transportation authorities make decisions, on its views about recent decisions, and on the ways in which citizens have participated or would like to participate in the decision-making process.

Students can develop a brochure for the library or public describing the ways in which the public can become involved in the decision-making process of public transportation authorities.

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*For further information write for copies of *Getting Involved in Transportation* (U.S. Department of Transportation, Office of Consumer Affairs: 400 7th and D Streets, S.W., Washington, D.C. 20590) and *In Productive Harmony: Environmental Impact Statements Broaden the Nation's Perspectives* (U.S. Environmental Protection Agency: Washington, D.C. 20460). See also the reading at the end of Activity 15.

IMPROVING URBAN MOBILITY

Improving Road Efficiency

Techniques to improve the people-carrying capacity of our streets and highways are of two basic types: those that improve the flow of vehicles and those that improve the efficiency of passenger vehicles by increasing the number of people carried per vehicle.

Improved Traffic Management

Many improvements in traffic management strive to relieve bottlenecks and promote smooth traffic flow. The range of improvements includes better channelization of traffic, one-way streets, effective parking regulations, exclusive lanes for turning vehicles, better signalization, progressively timed ("green flow") traffic signals, and computerized traffic-flow control.

All these techniques emphasize improved traffic flow and are effective in increasing the mobility, or ease of movement, of all the vehicles on the road. The effectiveness of these techniques, however, is often limited by the sheer volume of traffic. Road efficiency can be further improved by increasing the number of passengers each vehicle carries.

One way this can be done is to grant higher-occupancy vehicles preferential treatment in using the roads. Because an exclusive freeway bus lane can comfortably accommodate peak-hour volumes of over 25,000 passengers, or over eight times more people than in a normal mixed traffic lane, metropolitan centers across the country are using preferential or exclusive lanes to give travel priority to buses, passenger vans, and carpools.

Busways

The recently completed 11-mile busway on the San Bernardino Freeway carried a daily volume of over 10,000 bus passengers, an increase of 437 percent over 1972 prebusway averages. In addition to avoiding congestion on the regular lanes, Los Angeles commuters using the fringe parking facilities and taking this bus service into town enjoy at least a ten-minute time savings.

Contraflow Freeway Lanes

Another form of preferential treatment takes advantage of underutilized freeway lanes. During the morning of afternoon peak period, a freeway is often characterized by unbalanced traffic volumes: one side of the median is relatively free of traffic while the other side is congested with crawling traffic. By reserving one of these lanes on the left side of the median divider for buses and permitting them to drive against the usual direction of traffic, bus travel time is improved, congestion may be relieved, and the efficiency of the entire road is increased.

Reserved Freeway and Toll Plaza Access Lanes

Where the situation of traffic volume does not justify setting aside a reserved lane or creating a busway, other preferential treatment can be given to high-occupancy vehicles through entrance and exit privileges onto the freeway, at toll plazas, and onto bridges.

The "Blue Streak" project in Seattle, Washington, permits buses the exclusive use of an existing ramp on Interstate 5 which feeds into a special circulation loop in the center city. In the evening, the process is reversed, giving the 10,000 daily passengers a speedier exit from the downtown area.

Another approach gives high-occupancy vehicles priority at freeway metered-access ramps. Although the ramps are used by all traffic, buses, vans, and carpools are permitted to use a bypass lane avoiding the queued traffic. Minneapolis provided bus bypass lanes on nine metered-access ramps on I35W to facilitate express bus service.

Bottlenecks and congestion often occur during peak periods at toll plazas to bridges. By designating exclusive lanes for high-occupancy vehicles, more commuters can be encouraged to ride in a bus or in a carpool. Of the 17 lanes leading to the San Francisco-Oakland Bay Bridge toll plaza, the three center lanes are reserved exclusively for buses and carpools with three or more passengers. The one lane for buses carries 20,000 commuters across the bridge into San Francisco each morning while 1800 carpools use the two adjacent reserved lanes. Buses pass through the toll plaza without stopping. A "pay later" system bills the transit company directly. Carpool drivers may buy monthly toll passes at a reduced rate, a savings over the daily toll rate. These passes are affixed to the windshields, thus permitting these carpools nonstop passage.

All these techniques reduce the travel time for the priority passengers and heighten the attractiveness of buses and other ride-sharing systems.

Improving Bus Movement on City Streets

Programs to improve the people-carrying efficiency of the roads must extend into the heart of the city itself where the problems of congestion and air pollution are magnified.

Many cities have improved the flow of traffic in central business districts by increasing the vehicle-moving capacity of the street through various techniques. Restricting or prohibiting curb-lane parking can make this lane more productive, especially during peak periods. One-way streets, reversible lanes which adjust to traffic flow, better channelization, and signalization are all traffic engineering techniques that can significantly improve the vehicle-moving capacity of the streets. Some vehicles, however, use the street to move people more efficiently than others. Attention is now focusing on increasing the people-moving capacity of the street by granting preferential treatment to high-occupancy vehicles such as buses. One popular approach being used in several cities is to designate lanes either along the curb or within a previously unused street median exclusively for buses.

Bus Streets

Bus streets represent the full development of the bus lane concept. In dense urban areas with high bus volumes, entire blocks may be reserved for the exclusive use of buses. Such a provision corrects the often erratic loading and unloading practices caused by fleets of peak-period buses vying for limited curb space. In effect, two more curbs are created in the center of the street which permit more buses additional space to carry out passenger services, thus reducing the bus jam. Assigning specific boarding locations to the various routes with well marked signs also facilitates the process and can reduce total passenger travel time.

In Washington, D.C., a one-block section of a downtown street lined with office buildings is now a bus street and serves as a terminus for several major routes. Both Minneapolis and Chicago have created bus streets in limited areas.

Transit Priority at Intersections

A further increase in street efficiency is achieved through a variety of traffic control techniques that can benefit buses and other transit vehicles: lengthening or relocating transit stops to reduce vehicle-pedestrian conflict; permitting transit vehicles to override traffic signals and gain extra seconds of green time; or permitting buses to use restricted left-turn lanes at peak periods. These techniques help the transit vehicles move more smoothly and swiftly in dense traffic and thus increase their efficiency.

Improving the road efficiency through all these techniques both on the freeway and in city centers is a vital element in any program to improve urban mobility. In close harmony with better management of road space are policies and actions that improve and reinforce the level of public transit service.

IMPROVING PUBLIC TRANSIT SERVICE

There is no disagreement that buses can use road space more efficiently than private automobiles. Although ride-sharing programs that offer incentives to carpools can have an enormous impact on improving automobile efficiency by increasing the number of people each vehicle carries, many relatively low-cost improvements can be implemented quickly to encourage people to switch to public transit service. The primary elements in improved service are reduced travel time, more frequent service, and more reliable service.

Improved Scheduling

For many commuters, time is the single most important factor in choosing a method of travel. Increasing the frequency of buses and offering express bus service can attract new ridership by making travel time more competitive with that of the automobile. Many transit agencies are using the results of market research to modify routing patterns and serve the needs of whole clusters or strands of commuters. Washington, D.C., Cincinnati, Dallas, and Minneapolis, all participants in the Urban Corridor Demonstration Program, have had considerable success in attracting new riders by these methods.

Improved Routing

Many of these schemes to speed up commuter bus service concentrate on the suburb-to-center-city trip. However, a large number of potential transit riders are the near-in commuters who live within four to five miles of the central business district and often have no alternative but to use the automobile. Rerouting existing bus services could offer these commuters other alternatives.

Urban mobility can be enhanced by improving the in-town routing to more closely correspond to the travelers' needs. This technique is, of course, a basic goal of all transit operations and applies equally to the commuter and the local trip maker. New York City, for example, has greatly facilitated crosstown passenger movement both to and from the centrally located Port Authority Bus Terminal by rerouting segments of two existing routes. Both routes are proving very successful.

Route Information

Although not directly related to actual bus movement, improved route-information systems can promote increased ridership. Many potential riders are passively discouraged from traveling on buses by a lack of easily obtainable information. Route information improvements include such things as easily readable and usable pocket-size maps, route stops, and schedule cards, and route signs and maps at bus stop locations and on the vehicle itself. Route-information displays can also be located in high-activity centers such as supermarkets, libraries, shopping centers, office buildings, schools, and rail and air terminals.

Facilitating Transfer

The closer public transit approximates the door-to-door service of the private automobile, the greater is its attractiveness as a means of urban travel. Streamlining the transferring procedure can greatly improve public transit service.

Outlying transfer sites in low-density areas and at locations where transportation routes converge are the critical connecting points between the local transportation provided by the private automobile (including carpools) to express bus or rail. These transfer facilities take various forms from single-use facilities, such as the familiar suburban terminal parking lots, to specially cleared lots. Other transfer facilities for bus riders are being created through multiple use of existing parking facilities, such as parking lots in shopping centers, sports stadiums, and drive-in theaters. Maximizing the use of parking areas in these cases is possible because the greatest parking demand for the facility itself generally exists in the evening or on weekends.

In cases where park-and-ride or kiss-and-ride programs are located in commercial shopping centers, businessmen are receiving free advertising on the buses, in promotional literature from the bus service, and the added patronage of commuters who find it convenient to shop on their way home. Obviously, fringe parking facilities need not be elaborate. In many small-to-moderately sized lots, bus shelters may not be necessary as passengers find it equally convenient and even preferable to wait in their own vehicles until the bus arrives.

Potential for easing passenger transfer from one mode to another also exists at the distribution points within the city.

These distribution points may be actual terminal buildings such as the Port Authority Terminal in New York City, bus streets, or on-street curb lane facilities. To develop this potential requires greater coordination between express bus services and local bus, subway, taxi, and other surface transportation vehicles.

Providing readily available local transportation so that the traveler can continue his trip with as little interruption as possible saves time and enhances the attractiveness of public transit. The previously cited rerouting of two New York crosstown routes which increased local bus service to the midtown terminal illustrates this type of improved transit coordination.

Improved Fare-collection Methods

Streamlining the actual fare-collection procedure, including transferring, can also positively affect transit service. The exact-change requirement or token--in addition to its security--also shortens the passenger boarding time, as does requiring exiting passengers to use specific doors.

Tokens, stored-value tickets, punch cards, and other single-item fares speed the collection process. The stored-value fare which is purchased for either a specified amount, a specified time period, or both, offers additional benefits to transit. Not only does it speed the collection process, it also encourages people to use transit for noncommuting trips because they have already paid for the service and are therefore more likely to use it.

It is not only the employee who benefits from this concept. The employer is relieved of mounting parking pressures while the accessibility of the employment location improves. The transit operator realizes increased patronage and revenue gains. Prepaid systems which permit the passenger to purchase fare tickets in advance and cancel them before entering the vehicle also improve service by freeing the driver from fare-collecting tasks.

These alternative methods in fare-collecting improve actual transit service by reducing the time spent on such tasks. Other techniques can heighten the general attractiveness of public transit by facilitating the ticket transferring between modes. The combination ticket is a good illustration of this. Combination tickets which permit the passenger to transfer from express bus to a local bus or subway or vice versa not only save the passenger the trouble of depositing another fare but also encourage the use of public transit by improving its convenience quality.

Alternative Services

Improved urban mobility can be gained by molding transit service to meet special needs. Downtown "Shoppers' Special" and shuttles that run between activity points in urban centers and "Super Sunday" specials that offer not only reduced rates but also special service to zoos, parks, athletic fields, and recreation areas are proving very effective. These are becoming popular ways to meet travelers' needs, discourage automobile traffic in congested areas, and increase the use of public transit vehicles.

Demand-responsive Service

Another alternative type of transit service--demand-responsive transportation--concentrates on increasing the options available to people dependent upon public transit while also reducing the auto-dependency of people who can drive.

Demand-responsive transportation is known by many names: dial-a-ride, transvan, teletran, telebus, taxi-bus, etc. The basic service permits people to telephone for door-to-door transportation to a location within the specified service area. In this respect demand-responsive service closely resembles a taxi. In another respect, it resembles a bus in that the vehicle collects a number of people and carries them at the same time to their destinations.

Over 45 cities in 22 states have implemented demand-responsive programs. Each varies in its design and actual operation but all share the characteristics of flexible routing and scheduling, relatively small vehicles, and personalized door-to-door service. Demand responsive transportation plays several roles:

> Feeder services to regularly scheduled bus or rail transit. Passengers are gathered from many origins, often on a prescheduled, regular basis, and delivered to a common location such as a rapid transit terminal or a bus transfer facility. This process can be reversed to provide service from the terminal to scattered destinations.
>
> Transportation in low-density suburban areas ill-suited for traditional bus operations. Generally, service is offered between any origin-destination combination possible in the service area.
>
> Specialized service for the elderly, the handicapped, or those in fragile health who cannot walk for long distances to regular transit stops, cannot wait outdoors for indefinite periods or in inclement weather and cannot afford to hire a taxi.
>
> Alternative to the private automobile, particularly for commuting and local trip needs such as shopping, clinic visits, social meetings, and chauffeuring children.

The dial-a-ride programs in progress are tailored to a variety of urban and suburban situations. Service patterns vary, with vehicle fleets running from taxis to vans and minibuses and fare structures ranging from free to the most expensive taxi-based fare of over $1. The most popular single fare is 50¢ with 62 percent of all fares falling between 25 and 50¢. Many fare-charging services, however, offer discounts or free passes to senior citizens and multiple trip rates.

CITIZEN PARTICIPATION IN TRANSPORTATION PLANNING*

Citizen Input at the Initial Planning Stage

Throughout the public hearings, consumers expressed vocal support for a policy that would guarantee citizen participation and involvement in the transportation planning process at the beginning or, at least, at a very early stage. If citizens understand and are given opportunities to participate there is more assurance that social, economic, and environmental aspects will be fully considered in the planning process and less likelihood that neighborhoods will be seriously damaged or destroyed. They want an opportunity to provide input well in advance of public hearings, so that their concerns and thinking will be considered before plans reach such an advanced stage that it will be difficult to accommodate them. They want citizen participation to be genuine and meaningful with "no phoneyness," as one consumer put it. When highways are contemplated, they want alternatives presented so that these too can be considered. They desire to be involved in *all* aspects of transportation planning, even as it relates to other projects, such as housing and commercial development.

Facilitating Citizen Input

Consumers believe that officials should not merely wait for citizens to come to them; but that traveling community workers should go to residents in the community, particularly in the inner city, to talk to them and determine firsthand their needs and thinking. They also called for intensive study and extensive efforts to contact citizens *before* required public hearings are held. There is concern that there may be disproportionate representation in the planning process and at the public hearings from the highway lobby, industry, and special interest groups. Because of this, consumers want a greater effort made by government to inform the public, particularly the poor, of proposals being considered, the schedule of planned public hearings, and other meetings to which the public is invited. This information process should be accomplished through the efforts of community workers with wide distribution of multilanguage posters and publications and with door-to-door explanations of proposals and proposed meetings. The local newspaper is not a sufficient source of information since many don't read the paper or understand English.

Consumers asked that hearings be held in the evenings, at a time and a location convenient to the public, particularly the low-income people who cannot attend hearings during the day. They believe the convenience of the public should supersede the convenience of the engineers and planners. Some consumers believe that government agencies should help even to the point of subsidizing travel and other necessary

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*Taken from *The Voice of the Transportation Consumer: Executive Summary* (National Technical Information Service: Springfield, Virginia, 1975).

expenses of citizens to enable them to attend these hearings. They made the point that special interest groups are well funded but represent a biased viewpoint.

Some consumers also expressed support for legislation that will require all communities to have a recognized transportation consultant to represent the consumers' interests when building new transportation systems. Similar experts are provided in other areas of public concern, such as utility hearings, and they feel that the same provision should apply to the transportation planning process. One consumer in Pittsburgh suggested that all communities that apply to the Urban Mass Transit Authority (UMTA) for support to build a transportation system should be required to retain an acceptable consultant representing the people. Consumers also believe that there is a need for adequate representation of consumers on policy boards and in the planning, scheduling and management of public mass transportation systems.

Implementation of Citizen Input

Consumers strongly believe that planners should be required to implement the citizens' desires where feasible and not simply ignore them and that citizen input should continue to be considered in the operation of the transit system. However, they believe that once everyone has had an opportunity to be heard, officials should make decisions and take action promptly.

ACTIVITY #13

Mini-unit Topic: Improving Public Transportation

Approximate Class Time: 2-4 periods, plus out-of-class time

Capsule Activity Description: Students learn how to seek redress of grievances against unsatisfactory public transportation service.

Goal:

To know when and how to register complaints against unsatisfactory public transportation service.

Concepts Treated:

- Unsafe, inefficient, or unclean public transportation service may warrant complaints by the public.
- Consumers need to decide for themselves which inadequacies in public transportation service warrant seeking redress of grievances.
- Consumers are more likely to secure redress of grievances if they identify methods for doing so that they can predict will be successful.
- Complaints to public transit authorities should be sufficiently detailed to permit proper investigation by transit authorities.
- Public transportation officials may not be able to redress all consumer grievances.

ACTIVITY

This activity has two major parts. In the first, students discuss when and how to seek redress of grievances against unsatisfactory public transportation service. In the second part, students interview public transportation authorities to learn how to file complaints and how each agency handles consumer complaints.

Part One: Discussing Seeking Redress of Grievances

Students discuss seeking redress of grievances over a variety of dissatisfactions with public transportation services. Students can approach the topic of redress from four different but related perspectives:

1. Over what *issues* should consumers seek redress of grievances?

2. What should and could their *goals* be in seeking redress?

3. What *methods* would be effective for seeking redress?

4. What *constraints* may be operating that may make it difficult or impossible to seek or obtain redress?

Students in small groups can discuss one or more of these issues, preferably in the order in which they are listed above since that is the thought process through which a public transportation user should progress in order to successfully register a complaint. Each of these issues is discussed in more detail below. (In communities without public transportation, students who have lived in or traveled to other communities and used their public transportation systems can discuss dissatisfactions they may have had with those systems' operations.)

Students relate in their groups examples from their own experience of incidents that occurred when they used public transportation that made them feel they had a *right* to complain. Students can supplement their actual grievances with hypothetical ones--experiences they might have using public transportation which they feel would warrant a complaint. Students should be encouraged to be specific in their real or hypothetical complaints. Examples might be sloppy, dirty, or *unsanitary conditions* (such as dirty windows, dirt on floors of vehicles or stations, and food on seats); *failure to supply adequate services* or supplies (such as lack of toilet paper and other bathroom supplies or too few cars, on a train, or buses, on a route, resulting in crowding on available cars or buses or having to wait for the next train or bus); *equipment which is inoperative* or in difficult-to-operate condition (such as windows that do not open, open with difficulty, or are broken); *uncomfortable conditions* (such as ripped, broken, or loose seats, inadequate heating or air conditioning, crowding, and poor lighting); *safety hazards* (such as dangerous driving practices, including tailgating, speeding, weaving in and out of traffic, running red lights, not stopping for railroad tracks when required by law; faulty equipment, including seats not properly fastened, inoperative or poorly operating windshield wipers; not coming to a complete stop when allowing passengers to board or disembark; and attacks by pickpockets or robbers); and *unpleasant operator attitudes* and behaviors (such as anger, discourtesy, or insulting language and irresponsibility in terms of starting the trip on time, making unauthorized stops or detours along the route, or smoking in violation of vehicle rules). Having specifically identified examples of grievances for which they feel a passenger complaint would be justified, groups can generalize about what the nature of the grievance must be before a complaint is justified. For example, do all grievances about safety justify a complaint? Do grievances justify complaints only when several passengers are bothered? Groups report their justifiable grievances to the class and discuss the general reasons for which it is appropriate to register a complaint.

Groups then discuss what *remedies* they would want to seek for each of (or several of) the grievances they felt warranted complaints. For example, if one of their grievances is that a bus does not carry a first-aid kit, their goal may simply be to have one provided. However, if the grievance is that a driver operates the vehicle unsafely, there are a number of goals a citizen could seek to achieve in registering a complaint, such as enforcing safe driving practices, having the driver reprimanded, or having other disciplinary action taken by the bus company.

Students can next identify the *methods* by which passengers can secure redress of grievances, citing, if possible, personal experiences in seeking redress of grievances. The methods selected will vary with the nature of the complaint and the goals sought in redressing the grievance.

There are two steps in obtaining redress of grievances. The first is to *identify who has the ability and the authority to redress the grievance*--that is, who is in a position to make the desired change or require someone else to make the desired change. Possible people include vehicle operators; crew maintenance persons for vehicles and facilities; administrators of public transportation services at headquarters; regulatory agencies, including police, public health and safety boards; government agencies involved with health, safety, and transportation; and elected officials.

The second step is to decide *what methods* will effectively accomplish redress. In addition to personal complaints to transit authorities, consumers might explore other methods for securing redress of grievances, such as phoning, writing to, or meeting with appropriate consumer protection organizations, business associations, and legal groups and governmental agencies; circulating petitions and forwarding them to one or more of the above groups or to the appropriate transportation authority; asking local media to publicize complaints in letters to the editors, articles, phone calls to talk shows, etc.; and demonstrating (e.g., sit-ins, rallies, and picketing).

Finally, students identify the *constraints* that may make it difficult to seek or secure redress of grievances.

Having engaged in this theoretical discussion of how to seek redress of grievances against unsatisfactory public transportation service, students can now implement the second part of the activity--researching how to file complaints with different public transportation authorities and how each agency handles consumer complaints.

Part Two: Researching the Complaint-filing Process

In this second part of the activity, students not only research how to register complaints with public transportation authorities, they also develop a *reference file* that will help the class (and others to whom they may want to disseminate the file) to know precisely to *whom* to complain.

Although this part of the activity can be conducted by the entire class as a single large group, a better method is to break the class into small groups and have each group conduct the research with a different public transportation service in the community. Examples of such services include bus lines, including not only public authorities but also any private companies (Greyhound, Peter Pan, Trailways, etc.) servicing commuters; commuter train lines; taxi companies; ferry operators; subway systems; and light rail systems. However, if only one such service is available, students must all investigate that one.

Each group seeks the answers to the following questions from the public transportation authority responsible for the service selected by the group:

1. What are the major types of complaints the mode receives?

2. What kinds of people complain (elderly, poor, men, etc.)? Do certain types of people register primarily certain types of complaints?

3. With whom are complaints usually registered?

4. Are these the people to whom you would like complaints to be made? If not, why not?

5. Are there any interesting variations in the times when complaints increase or decrease--such as after fare increases or during certain periods of the year?

6. What is the authority's policy for handling consumer complaints? What is its procedure? What mechanisms and staff does it have to process complaints?

7. What constraints may make it difficult for the authority to be responsive to consumer complaints?

8. Have there been any law suits brought against the authority by citizens? If so, what were the issues and the outcomes?

9. What complaints does the *authority* have against *users* of its services and against other citizens who affect the system? What, if anything, does the authority system do about its grievances against the public?

Groups conduct the research primarily through interviews with authority officials and employees, but students can also poll the public about its complaints against public transportation modes and about whether they have registered their complaints with a transportation authority; read appropriate literature about citizen complaints, including promotional literature by the companies and *The Voice of the Transportation Consumer: Executive Summary*,* which describes the results of nationwide hearings on citizens' complaints about transportation in the United States; and register a consumer complaint of their own and review the experience.

After conducting their research, groups analyze the results and prepare a written or oral report for the rest of the class. Comparisons are then drawn among the different authorities in terms of (1) which authorities receive the most complaints and why; (2) whether certain authorities receive different types of complaints than others; (3) which authorities are responsive to consumer complaints and why; and (4) which have a regularized procedure for handling consumer complaints.

At the end of the activity, the class develops its reference file that indicates which consumer complaints should be directed at which persons or departments of each public transportation authority that was researched.

Evaluation Method:

Each student selects a recent example of a reasonable public transportation grievance and contacts the appropriate official to seek redress. Students report to the class on their experiences in seeking redress. Class makes revisions in its reference file as needed based on its efforts to seek redress of grievances.

Variations and Supplementary Activities:

Students can identify possible grievances nonpassengers may have against public transportation (such as excessive noise, air pollution, dangerous driving practices, and traffic congestion), discuss whether their grievances justify complaining, and if so, decide to whom to complain and how.

Students can invite a public transportation official to class to discuss grievances the public may have against public transportation service, whether these complaints are justified, and if so, what, if anything, is being done about them.

Students can investigate the complaints mass transit vehicle operators have against the public, including vandalism, rudeness, and unsafe behavior.

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*National Technical Information Service, Springfield, Virginia 22151. $5.25.

ACTIVITY #14

Mini-unit Topic: Improving Public Transportation

Approximate Class Time: 1-2 periods, plus out-of-class time

Capsule Activity Description: Students interview public transportation system employees and administrators to learn what constraints may make it difficult or impossible to improve service.

Goal:

To know what constraints make it difficult to improve public transportation service.

Concepts Treated:

- Many constraints make it difficult to improve public transportation.
- A major constraint to improving public transportation lies in funding problems.
- Many of these constraints can be overcome, whereas others may be insuperable.

ACTIVITY

The class breaks into small groups, and each group investigates the constraints operating on a different public transportation system--bus, commuter train, light rail, subway, ferry, and taxi. (In communities where there are only one or two systems, the activity can be conducted by the entire class.*) Each group identifies people within its system to interview, including operators of vehicles, administrators of the system, and regulators of the safety and finances of the system (such as state and local departments of transportation, health, and safety). Each group develops a set of questions for the people it plans to interview. Sample questions which students can consider asking follow:

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*If there is no public transportation in the community, students can interview town transportation and other officials to learn what constraints may make it difficult or impossible to provide service.

1. What arguments are usually raised against spending more funds for increased or improved public transportation services?
2. Who usually raises these arguments?
3. Are there ways in which the public interferes with improved service because of its lack of consideration in how it uses (or abuses) public transportation vehicles?
4. Are there environmental considerations that make it difficult to construct certain kinds of vehicles such as subways?
5. To what extent is it difficult to improve service because lack of ridership results in insufficient revenues?
6. Is there opposition to using public funds to support public transportation? If so, what argument does this opposition use?
7. Do political considerations play a large role in restricting the improvement or expansion of service?
8. Are the commissions, authorities, and agencies responsible for providing public transportation removed from public influence and therefore able to function without much regard for the community's concerns?
9. Does human nature play a restricting role in the improvement of services in the sense that anyone who has to spend eight to 12 hours a day five or six days a week driving a vehicle is likely to become callous to certain considerations of courtesy and safety?
10. To what extent does vandalism impede efforts to provide quality mass transit service?

After conducting their research, groups meet to discuss the following issues:

1. Is there agreement among the people interviewed about the major problems that make it difficult for them to improve or expand public transportation services? If there is not, what might account for this disagreement? Whose explanations should be given credence?
2. Might any of the explanations for lack of improvement or expansion of services be cop-outs--excuses for other less noble reasons for inaction?
3. Was there any tendency to pass the buck among the people interviewed--that is, blame someone else for the difficulties in improving public transportation?

At the conclusion of or periodically during the discussion, you can discuss complaints the public has against public transportation service and potential constraints to addressing these complaints and improving public transportation that students may not have learned about during their research. Examples of complaints the public may have against public transportation service may be found in Activity 13; examples of possible constraints to addressing these complaints to the public's satisfaction follow:

1. Priorities in the expenditure of funds result in lack of public funds for expensive but needed public transportation services.

2. Businesses, agencies, and individuals have vested interests against improving public transportation.

3. Lack of political or financial accountability by autonomous transit authorities, port authorities, etc.

4. Lack of awareness, unconcern, or disclaimers of responsibility by government agencies and businesses for the need for improved public transportation.

5. Political unpopularity of any position that involves persuading citizens to use automobiles less or increasing the costs or inconvenience of using automobiles in order to finance and promote public transportation.

6. The public's unwillingness to use public transportation, with the result that there are not enough revenues to sustain the costs of improvements.

7. Widespread belief that the government should not subsidize public transportation--it should be self-supporting.

8. Human factors discourage citizens from taking action (e.g., indifference; not wanting to lose benefits automobile travel confers; laziness; ignorance about the seriousness of the transportation problem or of what action they can take to solve it; lack of time; fatalism--belief that no action they can take will have any important effects; and selfishness--not wanting to give up the satisfactions and convenience of traveling by car).

Evaluation Method:

Students identify a constraint to improving public transportation service in their community that they can help eliminate and engage in citizen participation designed to reduce or eliminate the constraint.

Variations and Supplementary Activities:

Students can role-play one or more of the interviews they conducted for the benefit of the rest of the class and to experience some of the feelings involved in defending, justifying, or rationalizing (as the case may be) the problems involved in improving public transportation services.

Students can compare the constraints making it difficult to improve or expand public transportation services with problems European countries face, and have sometimes solved, regarding such services.

Students can study Japan's rail system and the benefits and drawbacks it presents.

Students can write mock letters to officials and other employees complaining about public transportation services while other students play the part of the officials and write responses explaining the constraints that make it difficult for them to satisfy the complaint registered.

Students can interview transportation officials on the problems of setting up company-based carpools--and carpools for government employees.

ACTIVITY #15

Mini-unit Topic: Improving Public Transportation

Approximate Class Time: 2-3 periods, plus out-of-class time

Capsule Activity Description: Students research methods of citizen participation designed to promote public transportation.

Goal:

To know how, with certain constraints, public transportation can be improved through citizen participation.

Concepts Treated:

- Many constraints make it difficult to improve public transportation.
- There are methods by which many, if not all, of these constraints can be overcome.

ACTIVITY

Small groups of students research the constraints that make it difficult for citizens to promote public transportation in their communities and throughout the nation. The groups also research methods for overcoming these constraints.

There are three research areas students can investigate:

1. *What obstacles* make it difficult for citizens to take action to promote public transportation?
2. *Who* on the local, state, and national levels can be influenced most easily and effectively by citizens to promote public transportation?
3. *How* can these individuals or groups be influenced?

Groups select a case study, either a live community issue or a hypothetical issue, such as the one provided on Spirit Master #2. The groups then decide which research methods to use, for example, reading available literature, interviewing appropriate officials, or polling the public.

Within the groups students divide up the responsibility for the research and carry it out. After completing the research, the groups compile their findings and prepare and deliver their reports to the class. You and those students not participating in the presentation fill in data or considerations not discussed by students, being certain that all the following points are covered:

Possible Obstacles

Groups or individuals may have vested interests against public transportation due to lack of political or financial accountability by autonomous transit authorities, port authorities, etc.; lack of awareness or unconcern by government agencies and businesses regarding the importance of public transportation; disclaimers of responsibility by government agencies and businesses for providing or improving public transportation services or vehicles; and claims by business or government that additional research is needed to verify the need for public transportation--placing the burden of proof on the environmental protection advocates. Some industries and businesses have powerful and well defined lobbies at all government levels; public transportation improvement would cost them money or involve loss of sales. Other obstacles include the press and media, some of whom may be dependent on advertising by businesses hostile to public transportation; politicians reluctant to support programs that might necessitate a tax increase or other actions not popular among the voters and political supporters; politicians reluctant to jeopardize campaign contributions from businesses or having business interests of their own that may be hurt by public transportation; lack of coordination among various government agencies and private businesses who could be involved in a unified program to promote public transportation; and log rolling among legislators: willingness to vote for (or to abstain from voting against) other legislators' bills in expectation of future reciprocal consideration.

Human factors that discourage citizens from taking action include laziness; resistance to spending tax money on public transportation; unawareness of the need for a balanced transportation system in which automobiles and mass transit complement each other; indifference; fear of reprisals; lack of time; fatalism or cynicism--belief that no action they can take will improve the situation; and selfishness.

The costs of providing adequate public transportation, in terms of both equipment and labor, are high. Public transportation is often expensive to initiate and operate. Other budget items (for example, schools, fire protection, law enforcement) are often considered to have higher priority for funds.

Who Can Be Influenced

Target groups to influence among the government, business and educational community include regulatory agencies and politicians, especially at election time. One should seek out the most responsive level of government--for example, local transit authorities for fares, schedules, routing, condition of buses, unsafe driver behavior, and lost items;

local officials for scheduling, routing, fares, condition of buses, and funding; consumer groups and Better Business Bureaus for scheduling, routing, fares, and condition of buses; newspaper action lines to give wider circulation regarding public transportation problems; the U.S. Congress for funding and lack of adequate public transportation service; the Urban Mass Transportation Administration (UMTA), U.S. Department of Transportation, for funding information and safety defects in public transportation equipment; and the National Highway Traffic Safety Administration (NHTSA), U.S. Department of Transportation, for reporting safety defects on automobiles and buses. Citizens and citizen groups most likely to take action include those whose personal interests are at stake--e.g., residents who need public transit--and those who have a sense of community responsibility.

How These Groups and Citizens Can Be Influenced

Target groups among the government, business, and educational community can be influenced by citizen participation in public hearings held by transportation planning agencies;* citizen involvement in local and state citizen advisory committees; and petitions and letter-mailing campaigns (these may be most effective with political leaders, especially during election years and when key bills are in committee or up for vote). One can also take part in peaceful rallies or picketing at key times and places to publicize the issues. This may make authorities take notice and bring pressure to bear on targeted individuals, agencies, or businesses and introduce aggressive legislation into legislatures and town councils. The mere proposal of legislation may bring results.

Citizens can also stage peaceful rallies that impart excitement, a feeling of participation, the hope of success to a line of action, and enlist new volunteers, and can run educational campaigns via fact sheets, newspaper advertisements, and lectures. Extremely important are the need for specialists, especially planners, who have the time and energy to devote considerable attention to the campaign, and the formation of coalitions among citizen groups for more power.

Evaluation Method:

Students engage in citizen participation in their community related to some aspect of public transportation. Students report their experiences to the class and compare results in terms of opportunities to become involved in citizen participation and methods for doing so effectively.

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*See Bibliography entries that discuss Federal regulations regarding citizen participation and the reading on "Participating in Transportation Planning" at the end of this activity.

Variations and Supplementary Activities:

Students can develop their own hypothetical case studies, similar to the one provided on Spirit Master #2, exchange them, and in small groups, individually, or as a class repeat one or more of the steps in the activity using the case studies as a point of reference.

Students can identify personal, social, and political actions citizens can take to obtain the improvements in public transportation service they feel the community should have.

Students can role-play a person advocating a public transportation improvement with a person who opposes the improvement, with each person seeking to convince the other of the rightness of his or her position.

Students can role-play and then discuss methods by which to persuade other people to use or increase their use of public transportation and carpools. After each role-play, participants read their role profiles to the class and discuss the feelings they had while role playing--in particular, "neighbors," "friends," and "relatives" discuss their emotional reactions to being asked to increase their use of public transportation or carpools. They also discuss which approaches used by the other role players were most effective in motivating them to switch to public transportation and why. Nonparticipants discuss what they would have said had they been involved. Sample role profiles follow.

SAMPLE ROLE PROFILES

Commuter Train

Public transportation supporter

You, Connie DiVellis, ride to work every day on the local commuter train. You find it's relaxing, inexpensive ($1.25 one way), and doesn't take too long. You used to drive the 40 miles to work every day, until you had to take the train because your car broke down one morning. When you realized it was so easy and enjoyable, you decided to keep on taking the train even after your car was fixed. It does take you an hour and a quarter to get to work by train, whereas it took only 50 minutes by car, but you are able to take advantage of the train ride to read the newspaper and relax. Your good friend at work, Otto Lopez, takes his car to work every day from about the same distance from another suburb. Sometimes when he gets to work he complains about the traffic, or the weather, or the problems he had starting his car. You think it would be a good idea both for him and for solving the pollution, energy and traffic problems if he would come to work by train. It's now your lunch break and you think it's a good time to encourage him to stop taking his car to work and use the commuter train instead. You have just taken a bite out of the cream cheese and olive sandwich your husband packed for you. After you swallow the first bite, you're ready to begin. What do you say?

Public transportation nonuser

You, Otto Lopez, commute to work every day by automobile. It takes you about 50 minutes, because you live 20 miles away from your job. Most of the time you like being able to drive, even if it does cost you $2.75 to park the car in a nearby parking lot. Sometimes driving is a hassle, however, for example in bad weather and when you nearly get into an accident. But you feel you have no other way to get to work. The commuter train is too expensive ($1.15 one way) and it would be a nuisance to have to wait for it every day. With your car, you can just hop in and get going! You're having lunch right now with your best friend at work, Connie DeVellis. You know she takes the train to work every day, and sometimes you wonder if you shouldn't, too. But, you think, as you bite into a tunafish salad sandwich, it's so pleasant in your car to turn on the radio and take off down the freeway. Connie seems about to tell you something, and you wonder if it's about her traveling by train to work.

Carpool

Carpool proponent

You have joined a carpool at work in an effort to save gasoline and money. Many of the other people in the factory have done the same thing. It's even turned out to be fun! You get to chat with your co-workers on the way in and back, so the drive is more interesting than it used to be. But the guy who works at the bench next to you is still coming to work in his car, all the way from Hillville, 22 miles away. This really concerns you, because here you are doing your share to conserve gasoline and he's not. There are at least two other workers who could form a carpool with him, so you've decided not to keep your feelings to yourself. It's the morning coffee break and you have just approached him to suggest he join a carpool. What do you say?

Carpool opponent

You live in Hillville, a small town, and work about 20 miles away in a factory. You drive to work every day, even though many of your fellow workers use carpools. You drive your own car because you can't stand to wait for someone to come pick you up, to wait for people to get together before you can leave work, and to drive out of your way to pick up other people. Each trip would take about 15 minutes longer for you in a carpool. You'd also have to put up with the poor driving habits of some of your fellow workers. Anyway, as long as you pay for your gasoline, why should anyone care? But here comes that guy who works at the bench next to you who's always talking about his carpool. You wonder if he's going to say something about your not being in a carpool. He'd better not!

Bus

Public transportation supporter

You are the daughter of a mother who lives in the suburbs and works eight miles away in the city. You're upset with your mother because she drives all the way to town and back every day, rather than take the bus, and pays $3.50 to park her car. If she rode the bus, she would have to walk three blocks, wait five to ten minutes, and pay 50¢ one way for the ride, but that's not so bad--you do it every weekend when you go into town to the movies. You think your mother is contributing to air pollution, wasting gasoline, and ruining her nerves in the traffic. You've finally worked up the courage to confront her about it. You have just sat down to dinner. What do you say?

Public transportation nonuser

You live in the suburbs with your husband and daughter. You drive to work in the city every day, even though it's an eight-mile drive, because you dislike sitting in buses--when you can find a seat. Besides, you would have to walk three blocks to get to the bus and change buses on the way. You'd also have to stand in good and bad weather to wait for each bus; they run only once every 15 minutes during rush hour. You would rather pay the $3.50 to park your car every day than to take the bus. Your daughter has made critical remarks to you once in a while about how you're wasting gasoline and how you come home complaining about the traffic. Now that you've just sat down to dinner, she looks as though she's going to bring up the issue again. If she does, what will you say?

Participating in Transportation Planning

The Federal Highway Administration (FHWA) works with state highway agencies to ensure that community organizations and individual citizens are actively encouraged to participate in the planning and design of Federal-aid highway projects. Under the Federal aid program, state highway agencies initiate, plan, design, build, and operate highway projects. (The FHWA provides financial assistance and guidance and is responsible for certain key approvals.) Each state highway agency has formulated a community involvement program--part of the state's action plan--which explains the procedures that are followed.

In addition to community involvement programs, each action plan explains how social, economic, and environmental factors are identified and studied, how the assistance of a wide range of professional skills is obtained and utilized, and how consideration of all feasible alternatives is assured in the highway planning process. Copies of action plans are available from state highway agencies or can be examined in their offices.

Action plan programs for community involvement include opportunities for interested citizens to participate in the planning and design process. In addition to public hearings, most states place emphasis on public meetings. Frequently such meetings are conducted as workshops, run with the assistance of local officials and agencies. In many instances coordination meetings are held with local officials prior to the public meetings. Under state action plans, mailing lists are maintained to provide early notification and continued information to known interest groups and individuals. Concerned citizens may contact their state highway agencies and ask to have their names placed on these mailing lists.

To ensure that environmental concerns and values are given systematic consideration equal to economic and technical considerations in the Federal decision-making process, the National Environmental Policy Act of 1969 (NEPA) requires each Federal agency to prepare a statement of environmental impact in advance of each major action, recommendation, or report on legislation that may significantly affect the quality of the human environment. Such actions may include new highway construction, harbor dredging or filling, nuclear power plant construction, large-scale aerial pesticide spraying, river channeling, new jet runways, munitions disposal, and bridge construction.

Each environmental impact statement must assess in detail the potential environmental impact of a proposed action, and all Federal agencies are required to prepare statements for matters under their jurisdiction. The statement's primary purpose is to disclose the environmental consequences of a proposed action, thus alerting the agency decision maker and the public to the environmental risks involved.

As early in the decision-making process as possible, and in all cases prior to agency decision, an agency prepares a draft statement for review by appropriate Federal, state, and local environmental agencies as well as by the public. The impact statement procedure affords the public an opportunity to participate in Federal decisions that may affect the human environment. Each draft statement must be made public by the responsible agency at the time it is circulated for comment, a date not less than 90 days before the proposed action. Draft statements are announced in the *Federal Register*, published daily by the U.S. government and subscribed to by some local public library systems, many university libraries, and most law libraries.

After comment from the agencies and interested parties, the statement is prepared in final form, incorporating all comments and objections received on the draft and indicating how significant issues raised during the commenting process have been resolved. Both draft and final statement are made available to the public. Interested citizens may submit comments to agencies on any impact statement issued by them. If an individual believes a draft statement to be inadequate, he may offer written comments on the draft. If he believes the disposition of his comment in the final statement to be inadequate, he may so notify the agency involved.

In addition to these mechanisms for public participation, many agencies provide for public hearings not only at various stages during the performance of their statutory missions but during the impact statement process itself.

The importance of the role citizens play in the impact statement process has been recognized by the courts. In many cases, the courts have upheld the right, or standing, of citizens to sue on environmental grounds.

BIBLIOGRAPHY

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The bibliography contains educational materials for teachers and students. It consists of selected

- Books, pamphlets, and flyers that can be read by teachers and students alike
- Additional publications and books for teachers and students on public transportation and related topics covered in this chapter
- Periodicals

The individual entries are presented in the following format:

** *Title of Work,* author, date of publication. Number of pages or list of materials. Price.

Type of Material — Description of material with evaluation of material's quality (except for supplementary materials) and relevance for public transportation education.

Source from which material may be obtained.*

For purposes of convenience, the teacher and student materials have been rated by the designation of stars next to the title of the material (see sample above). The stars represent the following evaluation:

no stars:	material is useful, but fair
(*) one star:	material is good
(**) two stars:	material is very good
(***) three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality and relevance.*** As such, the absence of a teaching material or a low rating does not per se indicate the material is poor. It may be excellent but simply not relevant to this chapter's content. In addition, any absences may be due to the authors' oversight.

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*Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found at the end of this Manual.

Teacher and Student Materials

*** *The Voice of the Transportation Consumer: Executive Summary*, 1975. 108 pages. $5.25.

Pamphlet/Report

This is a comprehensive and forthright report to the Secretary of Transportation on nationwide consumer public hearings conducted by the (Department of Transportation) Office of Consumer Affairs during 1971-1974. Presents in summary but highly readable fashion the results of 54 hearings conducted in 34 cities and towns. The report analyzes 1280 complete questionnaires received at the hearings. The report covers all aspects of transportation, but indirectly treats public transportation. A full report of the hearing results is also available and runs to 656 pages.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Catalog No. PB 241764

* *Social and Economic Effects of Highways*, 1974. 180 pages. Free.

Report

A report of the positive and negative effects that modern highways have on individuals, communities, and regions. Report is somewhat technical and requires close attention.

U.S. Department of Transportation
Federal Highway Administration
Office of Program and Policy Planning
400 7th and D Streets, S.W.
Washington, D.C. 20590

** *Carpooling Case Studies*, 1974. 31 pages. Free.

Report

Two articles that document successful carpool matching experiments, including maps and citizen questionnaires.

U.S. Department of Transportation
Federal Highway Administration
Urban Planning Division
400 7th and D Streets, S.W.
Washington, D.C. 20590

** *Buspools*, 1974. 18 pages. Free.

Report Description of buspools, with a discussion of the criteria for buspool opportunities.

U.S. Department of Transportation
Federal Highway Administration
Urban Planning Division
400 7th and D Streets, S.W.
Washington, D.C. 20590

** *Transportation for the Elderly: The State of the Art*, 1975. 162 pages. Free.

Report Somewhat technical but highly informative discussion of the nature of and possible solution for transportation problems faced by the elderly.

U.S. Department of Health, Education, and Welfare
Office of Human Development
Administration on Aging
Washington, D.C.

** *Transportation and Aging: Selected Issues*, 1972. 208 pages. $1.75.

Report Varied and informative selection of articles on various aspects of transportation and the elderly, including discussions of reduced-fare programs, mass transit and retired people, and several demonstration programs designed to improve transit services for the elderly.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 1762-0042

* *The Transportation Needs of the Rural Poor*, 1969. 244 pages. $6.00.

Report Results of a study of rural transportation in one rural area, with a selection on the study's application to other rural areas. Study includes a comparison of the free bus system with alternative transportation systems for the poor. Good overview in second chapter on rural poverty as it relates to transportation in general.

National Technical Information Service
Springfield, Virginia 22151
Document Number PB 185 253

* *Transportation and the Rural Community,* 1974. 19 pages.

Pamphlet/Report

Summary of conference on rural transportation. Report treats present status of rural transit, the relationship between transportation and rural development, and the potential of new technology as a solution to rural problems. Selections from the publication appear in the module in Activity 10.

National Technical Information Service
5825 Port Royal Road
Springfield, Virginia 22151

** *The 3M Commute-a-Van Program: Status Report,* 1974. 50 pages. Free.

Report

Description of a system whereby the 3M Company furnishes a 12-passenger van to an employee willing to take at least eight other employees to and from work.

U.S. Department of Transportation
Federal Highway Administration
400 7th and D Streets, S.W.
Washington, D.C. 20590

*** *Improving Urban Mobility,* 1975. 30 pages. Free.

Pamphlet

Highly creative discussion of ways in which bus service can be improved by manipulating the traffic environment and bus system. Discussion focuses on special bus lanes and streets, improving traffic management, improved scheduling and routing, improved fare collection methods, and alternative vehicles types.

Federal Highway Administration
Urban Planning Division
Transit and Traffic Engineering Branch
Washington, D.C. 20590

** *Access for All: Transportation and Urban Growth,* 1975. 176 pages. $2.45.

Paperback

Stimulating discussion of how transportation availability influences residential, work, and recreational patterns. Thesis is that the introduction of the automobile has resulted in unequal access to transportation and discouraged contact among different socioeconomic groups in society. Book traces the history of public transportation in America. Full of revealing insights into the nature of public transportation, but some readers may find some of the reading heavy and the illustrations (e.g., Boston) parochial.

Penguin Books
7110 Ambassador Road
Baltimore, Maryland 21207

** *The Accessible City,* by Wilfred Owen, 1972. 150 pages. $2.95.

Paperback Discussion of big-city transportation problems, their nature and how they can be solved. Book provides considerable basic factual information on the worldwide and national urban transportation crisis. Main thesis is that transportation must be planned in the context of more important objectives, such as the provision of housing, health, employment, and recreation opportunities.

The Brookings Institution
1775 Massachusetts Avenue
Washington, D.C. 20036

* *Urban Transportation Needs,* 1972. 56 pages.

Report Series of eight lectures on various transportation topics. Two are relevant: one on urban transportation needs, an overview of big city transportation problems, and a second on political and institutional factors, financing, and time lag.

Center for New York City Affairs
New School for Social Research
72 Fifth Avenue
New York, New York 10011

** *Transportation Alternatives,* 1972. 55 pages plus appendices.

Report Study of people's attitudes toward personal use of modes of transportation other than cars. Respondents in four cities, Chicago, New York, Washington, D.C., and Los Angeles, were questioned about their attitudes toward use of transportation modes other than cars in their personal lives--e.g., under what circumstances would they use mass transit to commute to work rather than their cars? Interesting study that concentrates on environmental issues of excessive car use. Concludes that people will make minor accommodations to environmental issues (e.g., pay up to $200 for pollution controls on their cars) but will not give up use of cars to any appreciable extent despite financial and other inducements to use other means of transportation.

Student Competitions on Relevant Engineering (SCORE)
c/o Professor J. H. Sonunu
Tufts University
Medford, Massachusetts 02155

*** *Transpo Topics for Consumers* (not dated). 8 pages. Free.

Periodical

Useful quarterly newsletter on a variety of transportation subjects. Discusses such topics as legislation, local transportation programs, new publications and teaching materials.

Department of Transportation
Office of the Secretary
Office of Consumer Affairs
400 Seventh Street, S.W.
Washington, D.C. 20590

*** *Rites of Way: The Politics of Transportation in Boston and the U.S. City*, by Alan Lupo, Frank Colcord, and Edmund P. Fowler, 1971. 294 pages. $3.95.

Paperback

Detailed account of how community opposition in metropolitan Boston forced the state and local governments and quasi-independent commissions to abandon plans to construct freeways in and around the city. Book also discusses who makes transportation decisions in major U.S. cities, the politics of such decisions, and the elements that should be included in comprehensive regional transportation planning. While a unique and fascinating document of one community's struggle and strategies to be heard, some readers may find the level of detail wearing.

Little Brown and Company
34 Beacon Street
Boston, Massachusetts

* *The Urban Transportation Problem,* J. R. Meyer et al., 1966. 427 pages. $4.50.

Paperback Textbook

In-depth survey of urban transportation issues. A standard treatment of such issues as recent trends in urban location, highway financing, line-haul systems, and costing procedures. Although generally accessible to the lay reader, several sections require a knowledge of statistics to be fully understood.

Harvard University Press
79 Garden Street
Cambridge, Massachusetts 02138

Transportation Noise and Its Control, 1972. 27 pages. 70¢.

Pamphlet Informative, not too technical discussion of the nature of noise pollution, the decibel unit of measurement, the extent of noise caused by cars, trucks, planes, and rapid transit, and possibilities for reducing or eliminating transportation noises.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 50000-0057

** *Transportation Noise Pollution: Control and Abatement*, 1970. 190 pages. $6.00.

Pamphlet Very informative, in places technical discussion of the causes of transportation noise pollution and what can be done about them. Excellent charts, graphs, and cartoons.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Stock Number N71-15557

*** *Getting Around: People and the City*, 1974. 48 pages. $1.29.

Pamphlet Informative, thought-provoking case studies and discussions on urban transportation, including commuting, rapid transit, citizen action, dial-a-bus, mass transit, banning cars, and the Bay Area Rapid Transit (BART) in San Francisco. Discussion questions are provided. Well illustrated; photographs.

Scott, Foresman and Company
1900 Eastlake Street
Glenview, Illinois 60025

** *Health Effects of Environmental Pollution*, 1973. 20 pages. 30¢.

Pamphlet Highly useful overview of the effects of air, water, and noise pollution on human health.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

** *Automotive Fuels and Air Pollution,* 1971. 32 pages. 40¢.

Pamphlet Detailed account, for the layman, of automobile pollutants, their effects, and what can be done to eliminate or reduce them.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

*** *A Citizen's Guide to Clean Air,* 1972. 95 pages. Free.

Pamphlet An extremely useful, detailed account of the clean air laws and how citizens can advocate and plan for the control of air pollution. One chapter deals with auto emission controls, another with the citizen's legal rights, and a third with the citizen's role in policy making.

The Conservation Foundation
1717 Massachusetts Avenue, N.W.
Washington, D.C. 20036

** *Don't Leave It All To the Experts: The Citizen's Role in Environmental Decision Making,* 1972. 9 pages. Free.

Pamphlet Identification of methods by which citizens can protect the environment, including becoming informed, knowing the law, lobbying, fighting for funds, and knowing your rights.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

* *Citizen Action Can Get Results,* 1972. 20¢.

Pamphlet Three somewhat superficial case studies of how community political action successfully reduced environmental pollution. One case study on air pollution indirectly involves auto pollution. However, the case studies are useful as examples of citizen action, even though they are not directly related to transportation's environmental effects.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 5500-0070

Transportation Consumer's Guide to Programs and Services of the United States Department of Transportation, 1974. 36 pages. Free.

Pamphlet Descriptions of the structure and functions of the several agencies within the Department of Transportation, along with a list of consumer publications each agency has available.

Department of Transportation
Office of Consumer Affairs
400 Seventh Street, S.W.
Washington, D.C. 20590

* *In Productive Harmony: Environmental Impact Statements Broaden the Nation's Perspectives*, 1972. 13 pages. Single copies free.

Pamphlet Describes the provisions of the National Environmental Policy Act of 1970 and the nature of an environmental impact statement, including the Environmental Protection Agency's role in a statement's development.

U.S. Environmental Protection Agency
Office of Public Affairs
Washington, D.C. 20460

* *Citizen Participation in Transportation Planning*, 1973. 142 pages. $5.00.

Booklet Papers from a conference on the Boston Transportation Planning Review which consider issues of citizen participation well beyond the Boston experience. Papers include discussion of the politics of transportation planning, nonwhite viewpoints, rural citizen involvement, and ecological concerns in transportation planning.

Highway Research Board
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

*** *Getting Involved in Transportation*, 1976. 12 pages. Single copies free.

Pamphlet Describes the nature of environmental impact statements and offers specific suggestions for how the public can become involved in their formulation and in transportation planning in general.

U.S. Department of Transportation
Office of the Secretary
Office of Environment, Safety and Consumer Affairs
400 7th and D Streets, S.W.
Washington, D.C. 20590

* *Rethinking Your Automobile*, 1973. 6 pages. Free.

Flyer Brief discussion of consumer's role in reducing use of cars in view of the energy shortage.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

** *Ridesharing: A Better Way To Use Cars and Highways* (not dated). 10 pages. Free.

Flyer Discussion of the advantages of carpooling for the environment and energy conservation, how carpooling reduces transportation costs, and how to promote carpooling.

U.S. Department of Transportation
Federal Highway Administration
400 7th and D Streets, S.W.
Washington, D.C. 20590

** *Transit Fact Book*, 1976. 47 pages. Free.

Booklet Gives brief history of public transportation and provides various statistics on public transportation usage and financing from 1900 to the present.

American Public Transit Association
1100 17th Street, N.W., Suite 1200
Washington, D.C. 20036

** *Innovation in Public Transportation. A Directory of Research, Development and Demonstration Projects*, 1975. $1.85.

Directory
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Background Literature for Teachers and Students

Appleyard, Donald et al., *The View From the Road* (MIT Press: Cambridge, Massachusetts, 1964).

Buel, Ronald A., *Dead End: The Automobile in Mass Transportation* (Prentice-Hall: Englewood Cliffs, New Jersey).

Center for Transportation Studies, *Transportation for the Handicapped* (Eagleton Institute of Politics: Rutgers University, 1969).

Department of Transportation, *Conference on Transportation and Human Needs in the 70's* (National Technical Information Service: Springfield, Virginia 21151). Catalog No. PB 224925.

Farris and McElhiney, *Modern Transportation: Selected Readings,* Second Edition (Houghton Mifflin: Boston, 1973).

Howson, Henry Frederick, *The Rapid Transit Railways of the World* (Allan and Unwin: London, 1971).

Kraft, Gerald et al., *Free Transit* (Heath: Lexington, Massachusetts, 1970).

Lang, A. et al., *Urban Rail Transit* (MIT Press: Cambridge, Massachusetts, 1964).

Levin, Melvin and Norman Abend, *Bureaucrats in Collision, Case Studies in Area Transportation Planning* (MIT Press: Cambridge, Massachusetts, 1971).

Meyer, J. R. et al., *The Urban Transportation Problem* (Harvard University Press: Cambridge, Massachusetts, 1965).

Murray, James J. (ed.), *Urban and Regional Ground Transportation* (Planning-Transport Associates, Inc.: Durham, North Carolina, 1973).

Sampson and Farris, *Domestic Transportation: Practice, Theory, and Policy,* Second Edition (Houghton Mifflin: Boston, 1971).

Smerk, George M. (ed.), *Readings in Urban Transportation* (Indiana University Press: Bloomington, 1968).

Stone, Tabor R., *Beyond the Automobile* (Prentice-Hall: Englewood Cliffs, New Jersey, 1971).

Tass, Leslie, *Modern Rapid Transit* (Carlton Press: New York, 1971).

U.S. Department of Health, Education and Welfare, *Transportation and Aging: Selected Issues* (Washington, D.C., 1970).

U.S. Department of Health, Education and Welfare, *Transportation for the Elderly: The State of the Art* (Washington, D.C.: 1975).

U.S. Department of Transportation, *Travel Barriers* (National Technical Information Service: Springfield, Virginia 22151). No. PB 187327.

U.S. Department of Transportation, *Conference on Transportation and Human Needs in the 70's* (National Technical Information Service: Springfield, Virginia 22151). No. PB 224925.

Periodicals

In addition to the periodicals listed below, teachers and students can consult in libraries the *Reader's Guide to Periodical Literature* for past articles on public transportation.

Highway and Urban Mass Transportation
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

High Speed Ground Transportation Journal
International Society for Terrain-Vehicle Systems
Box 4824, Duke Station
Durham, N.C. 20006

IRT Newsletter
Institute for Rapid Transit
Suite 508, 1612 K Street, N.W.
Washington, D.C. 20006

Mass Transit
538 National Press Building
Washington, D.C. 20045

Transit Journal
The American Public Transit Association
1100 17th Street, N.W.
Washington, D.C. 20036

Transportation U.S.A.
U.S. Department of Transportation
Office of Public Affairs
400 7th and D Streets, S.W.
Washington, D.C. 20590

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

Glossary

Articulated bus is two buses joined together to allow a shorter turning radius on city streets. It needs only one driver and can carry 70 people. These buses have been used in Europe for a number of years but they are just now being added to the American public transportation network.

Cable car is a railway vehicle which operates in street traffic. It is propelled by moving cables located below the street surface and powered by engines or motors at a central location not on board the vehicle.

Demand-responsive vehicle is relatively new in American transportation. It has the features of a taxi and a bus and usually looks like a van. People call for service like they do for a taxi, but they pay lower fares and may ride with several other people going to a similar destination.

Double decker bus is a rubber-tired self-propelled vehicle which has two levels enabling it to carry twice as many passengers. It has been used extensively in Europe and is now being reintroduced to American public transportation.

Heavy rail (subway/elevated train) is a subway-type railway vehicle constructed on high-level platform stations.

Hydrofoil is a boat which travels on the surface of the water rather than in the water. This enables it to move much faster than ordinary boats.

Light rail (trolley) is the term usually given to the streetcar-type railway vehicle. Light rail is constructed and operates on city streets.

Public transportation refers to all modes of travel which operate within a community (as opposed to modes operating between cities and towns) and which involve vehicles which are publicly owned (e.g., by the government) or owned by private business (e.g., a taxi company), as opposed to vehicles which are owned by private citizens (including automobiles, bicycles, and recreational vehicles). Public transportation also includes the facilities (e.g., bus stop shelters and ferry docks) which serve public transportation vehicles and passengers.

TRANSPORTATION
AND
THE ENVIRONMENT

TRANSPORTATION AND THE ENVIRONMENT: AN OVERVIEW*

The Problems

American consumers are the purchasers and users of personal transportation goods and services amounting to nearly $124 billion every year. However, transportation and the environment are in many respects in a state of conflict. Transportation vehicles and facilities cause damage to the environment: even with improvements in the control of auto emissions, the motor vehicle is still a major pollutant of our air; heavy traffic congestion clogs roads and city streets (77 percent of the nation's work force commutes to work every day by private automobile; more than 70 percent of these people drive alone); and 18 percent of the nation's energy supply is consumed by motor vehicle transportation, of which nearly 80 percent is for personal travel by car, truck, or bus. (Early 1976 figures indicated an increase in vehicle fuel consumption, reverting to patterns that had been prevalent before 1974 and 1975 when Americans reduced vehicle fuel consumption in response to the immediate fuel crisis.) In addition, the motor vehicle is responsible for much of the visual pollution of our countryside--billboards, litter, and automobile junk yards, as well as many badly designed gas stations, parking lots, and bus stations.

However, transportation vehicles and facilities also enhance or preserve the environment in numerous ways and make scenic areas more accessible to the public. These beneficial effects must be balanced against the damage transportation causes to the environment.

It also must be remembered that the environment, in turn, can interfere with transportation; for example, natural obstructions to visibility, confusing traffic signs, and poorly designed roads are obstacles that hamper travel safety, comfort, convenience, and enjoyment.

We must work to bring transportation and the environment into balance with one another by shifting emphasis from environmentally damaging forms of transportation to modes of travel that do not harm the environment unnecessarily.

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*For the purpose of this Manual we have defined "environment" broadly to include a wide variety of factors that interact with travel, including natural resources, residential patterns, land space, and visual obstructions. The concept includes both the natural environment and the man-made environment.

The Solutions

Solutions to the problem depend on many factors and people: local transit authorities must generate greater use of their services by making public transportation more accessible and attractive to the daily traveler; citizens/consumers must become informed of local transportation and environmental problems and participate in their solution; and classroom teachers must guide students to a better understanding of the causes and effects of transportation and environmental problems, and of possible solutions. Classroom education and transportation consumer education can offer the public a unique opportunity to develop awareness and skills essential to acquiring responsible transportation and the environment habits and to play a role in balancing the often conflicting needs of transportation and the environment in the community.

This chapter focuses on developing consumer skills that are particularly appropriate for adults. The learning activities are deisgned to

- Stimulate awareness and understanding of *transportation and environmental issues* and provide information regarding the complex *interrelationships* between transportation and the environment
- Teach about the *effects*--both good and bad--transportation vehicles and facilities have on the environment
- Teach about the unique effects *automobiles and highways* have on the environment--both harmful and beneficial
- Stimulate awareness and consideration of both the critical needs transportation meets in contemporary American society, including the provisions of *job opportunities*, and also the extent to which highways, roads, airports, and mass transit facilities *consume land* and displace residents and businesses
- Teach about the ways in which some features of the *environment* can interfere with safe, convenient, and enjoyable *travel*
- Develop the capacity among the public to be wiser *purchasers* of consumer transportation services and goods
- Promote the ability *to identify resolutions to conflicts* between transportation and the environment, including awareness of solutions to situations in which individuals are or will be personally inconvenienced or endangered by harmful transportation effects on the environment.

- Stimulate individuals to *take actions* now or in the future in their personal lives to resolve conflicts between transportation and the environment, such as increasing their use of public transportation and carpools

- Motivate the public to engage in activities related to transportation and the environment which will improve *living conditions* within their own communities

- Stimulate the public to engage now or in the future in *citizen participation* designed to resolve conflicts between transportation and the environment

- Develop awareness of the *political considerations* that can make it difficult to effectively balance the needs of transportation and the environment and of methods for overcoming these constraints

- Introduce concepts of *planning transportation systems* and participation in transportation planning

MINI-UNITS AND ACTIVITIES

Activity #	Activity Description	Class Time (periods)
	Mini-unit 5 **Observing the interrelationships between transportation and the environment**	
16	Students observe noise, air, water, and visual pollution and benefits to the environment associated with transportation vehicles and facilities.	½-1
17	Students take field trips to place themselves in the position of people who experience transportation's beneficial and harmful effects.	1½-2
18	Students research the extent to which automobile service facilities consume land and provide employment in their community.	1½-3
19	Students discuss ways in which features of the environment can create obstacles that interfere with travel safety, convenience and enjoyment.	½-1
	Mini-unit 6 **Studying problems and solutions relating to conflicts between transportation and the environment**	
20	Students read and evaluate accounts of transportation's effects on the environment.	1-2½
21	Students discuss the automobile's indirect effects on the environment.	½-1
22	Students discuss and role-play personal actions citizens can take to reduce the harmful effects of transportation vehicles and facilities on the environment.	1½-2
23	Students discuss and evaluate actions the government is taking to reduce transportation's harmful effects on the environment.	½-1
24	Students discuss solutions to conflicts between transportation and the environment.	1-3
	Mini-unit 7 **Studying transportation planning as a means of promoting harmony between transportation and the environment**	
25	Students discuss what environmental criteria should be considered in transportation planning designed to promote harmony between transportation and the environment.	1-2
26	Students research the value of citizen participation in transportation planning and methods for participating.	2-4
	Mini-unit 8 **Investigating citizen participation to resolve conflicts between transportation and the environment**	
27	Students discuss what kinds of citizen participation the public can engage in to balance the needs of transportation and the environment.	1
28	Students role-play scenarios in which community residents or groups protest harmful effects of transportation on the environment and adverse effects some features of the environment may have on travel.	½-1
29	Students discuss when to engage in citizen participation to oppose a harmful transportation effect on the environment or a feature of the environment which interferes with travel.	1
30	Students engage in citizen participation to reduce transportation's harmful effects on the environment or to alter hindrances to travel caused by features of the environment.	2-6

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 5

OBSERVING THE INTERREALTIONSHIPS BETWEEN TRANSPORTATION AND THE ENVIRONMENT

Many transportation vehicles damage the environment, from automobiles to airplanes to snowmobiles. In addition, the environment can be affected by the by-products of transportation *facilities*, from highway construction noises to gas stations odors. This unit treats the general effects these transportation vehicles and facilities have on the environment. This unit also involves students in examining the *beneficial* effects transportation has on the environment, often a neglected aspect of the field. The unit seeks to impress upon students that decisions about transportation and the environment must be made in the light of transportation's benefits to society and to the environment as well as in response to its damage to the environment.

Various features of the *environment* may also affect *travel* safety, convenience, expense, and enjoyment. This unit is designed to help students explore the relationship between transportation and the environment from this perspective, too.

In short, this unit promotes the major concept that there are many *interrelationships* between transportation and the environment and that the interaction between the two must be kept in mind in any attempt to balance the often conflicting needs of both.

Other important concepts treated in this unit are the following:

- Understanding the effects of transportation on the environment is promoted by putting oneself in the position of people who are directly affected by transportation facilities and vehicles.
- Highways, roads, and other facilities which make automobile travel possible consume a large percentage of land in the average community.
- Highways, roads, and other facilities which make automobile travel possible also provide considerable employment in the average community.
- Citizens need to assess the relative advantages and disadvantages of using local land space for automobile travel instead of putting the land to other uses.

The unit also uses a particular approach to studying the interrelationships between transportation and the environment--that of direct observation. Whereas classroom learning and reading can promote an understanding of these interrelationships, actually identifying and analyzing them in the local community can provide a more enriching and lasting learning experience. This unit therefore involves students in going out into the community to get a first-hand view of the multifaceted interactions between transportation and the environment.

MINI-UNIT 5 LESSON PLAN

Observing the interrelationships between transportation and the environment

Activity #	*Activities*	*Class Time*
16	DESCRIPTION: Students observe noise, air, water, and visual pollution and benefits to the environment associated with transportation vehicles and facilities. GOAL: To know some of the beneficial and harmful effects transportation has on the environment.	½-1 period, plus out-of-class time
17	DESCRIPTION: Students take field trips to place themselves in the position of people who experience transportation's beneficial and harmful effects. GOAL: To know how transportation affects the environment.	½-1 period, plus out-of-class time
18	DESCRIPTION: Students research the extent to which automobile service facilities consume land and provide employment in their community. GOAL: To be aware of the extent to which automobile travel requires land use in the local community.	1½-3 periods, plus out-of-class time
19	DESCRIPTION: Students discuss ways in which features of the environment can create obstacles that interfere with travel safety, convenience, and enjoyment. GOAL: To know how features of the environment can hamper travel safety, convenience, and pleasure.	½-1 period, plus out-of-class time

Total Class Time: 4-7 periods.

ACTIVITY #16

Mini-unit Topic: Observing Interrelationships

Approximate Class Time: ½-1 period, plus out-of-class time

Capsule Activity Description: Students observe noise, air, water, and visual pollution and benefits to the environment associated with transportation vehicles and facilities.

Goal:

To know some of the beneficial and harmful effects transportation has on the environment.

Concept Treated:

- Transportation vehicles and facilities have both beneficial and harmful effects on the environment which can be readily observed.

ACTIVITY

Adults, whether they travel or not, are often constantly exposed to a variety of sounds, sights, smells, and tactile sensations related to transportation vehicles and facilities. For this activity, students keep a detailed written list of their observations of these transportation effects on the environment for a given period of time, such as one day, two days, or a week. Examples of types of exposures that you and your students can add to follow:

- Negative effects: loud airplane noises; automobile noises due to defective mufflers, accidents, modified or "souped-up" vehicles, "squealing" tires, horns, etc.; unpleasant exhaust smells from buses, trucks, cars, etc.; oily water due to boat accidents; and visual unsightliness (billboards, gas stations, parking lots, car "graveyards," etc.)

- Positive effects: fighting forest fires; crop spraying; viewing scenery; garbage collection; airlifting food to stranded livestock; forest seeding and fertilizing; weather control; insect control; pollution monitoring; and providing access to parks and other natural environment areas

After collecting observations, students read the results to the class, total the type and number of observations, and correlate them by transportation mode--cars, planes, etc. Class then discusses the possible good and bad effects some of these activities may have on people's physical and mental health; methods by which the harmful effects could be reduced or eliminated; and any constraints that may make eliminating the harmful effects and preserving the beneficial effects difficult or expensive.

Evaluation Method:

Students describe several examples of the beneficial and harmful effects transportation has on the environment, indicating why the effects they cite are good or bad.

Variations and Supplemental Activities:

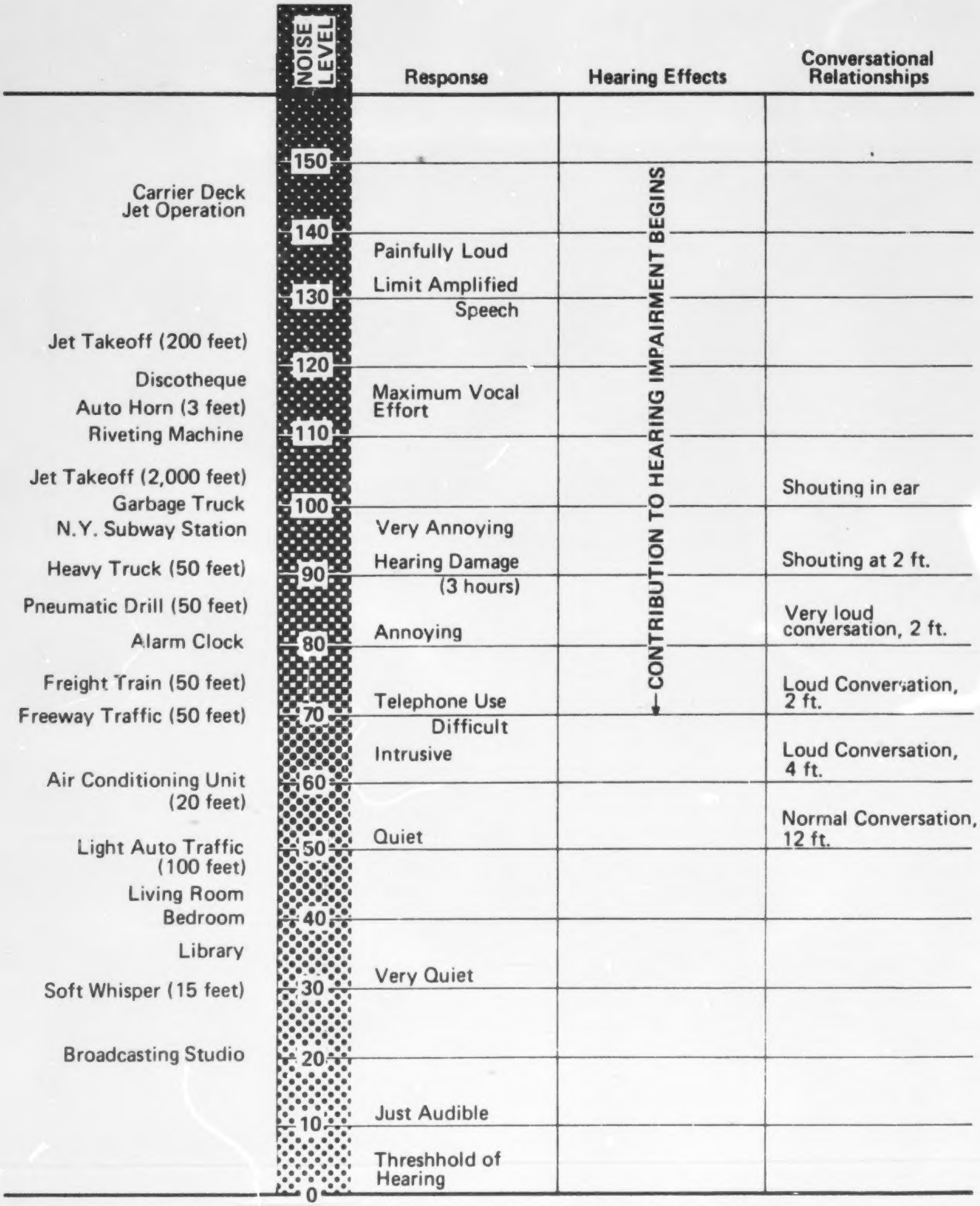
Students can identify and classify pleasant and unpleasant noises associated with transportation vehicles and facilities by keeping a log of the sounds they hear emanating from transportation sources, such as sirens, horns, engines, car tires squealing, and accidents. Students should be instructed to be aware of the following considerations in keeping their logs:

- They should be attuned to sounds not just from obvious vehicles like cars and airplanes but also from less-obvious transportation-related sources like highway construction crews.
- They should try to notice if there are transportation sounds they do not "hear," like the humming of lights in a library or background music in a store, that nevertheless may have an effect on people.
- They should keep an eye out for modified or souped-up vehicles that create noises the original vehicle did not.

The chart on the following page may be reproduced and used during the follow-up discussion to this variation.

Students can identify and discuss the beneficial ways in which aircraft are used in relation to the environment. One of the sections in Chapter III, "Readings on Transportation and the Environment," addresses this issue.

Sound Levels and Human Response



Source: *Noise Pollution,* U.S. Environmental Protection Agency, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

ACTIVITY #17

Mini-unit Topic: Observing Interrelationships

Approximate Class Time: 1½-2 periods, plus out-of-class time

apsule Activity Description: Students take field trips to place themselves in the position of people who experience transportation's beneficial and harmful effects.

Goal:

To know how transportation affects the environment.

Concepts Treated:

- Transportation has impacts on the environment that directly affect people in both positive and negative ways.
- Understanding the effects of transportation on the environment is promoted by putting oneself in the position of people who are directly affected by transportation facilities and vehicles.

ACTIVITY

Small groups of students visit sites where transportation's effects on the environment are visible in order to experience the effects themselves. Although the students may have experienced some of these effects personally as commuters, recreational vehicle users, or apartment dwellers or homeowners, there will be other effects of which they were previously unaware or whose level of severity they did not realize.

Groups begin by deciding what sites to visit. Sample sites are described on the following page. Groups then determine for each site what observations they plan to make at the site. Sample questions to ask are also provided on the following pages. Groups make their own travel and access arrangements.

After conducting the field trips, groups meet to discuss their experiences and to answer questions they posed at each field site visit. Part of the discussion should focus on the extent to which residents have a limited grievance if they became residents *after* the problem existed or have taken *no preventive measures* of their own. Groups prepare and present report to class describing experiences. Groups respond to questions and comments from you and the other groups.

Evaluation Method:

Students write "autobiographical" sketches of a day in the life of a typical resident or worker in one of the sites they visited, singling out the impact of transportation vehicles and facilities on his or her life.

Sample Field Visit Sites and Questions

Residential Area Near an Airport and Over Which Planes Take Off and Land. Students can listen to noise, attempt conversation during it, attempt to listen to a portable radio during it, and question passers-by about their reactions to the noise, including teachers and elementary and secondary school students at any nearby schools. Students can seek answers to such questions as:

Does the noise hamper communication? To what extent?

Does the noise cause discomfort? How much?

Does the noise make it hard to concentrate? To think?

How often does the noise occur?

Do residents seem (or say they are) bothered by it?

Did residents move into the area before or after the airport was built or expanded?

Have or could residents take any steps to try to reduce the noise--for example, plant trees or build walls?

Who benefits from the airport and how are they benefited? Do the benefits outweigh the adverse effects? Why?

Residential Area in Which There Are Major, Limited-access Highways or Busy Roads Traveled by Cars and Trucks at High Speed. Students can listen to the noise, attempt conversation, or listen to a radio during it and can question people who live in abutting houses about their reactions to whatever noise and exhaust fumes may be evident. Standing in one place, students can seek to determine if the ground shakes as vehicles pass. Students can seek answers to specific questions such as the eight listed above and to the following:

Does the automobile exhaust make breathing unpleasant?

Do the vehicles shake the ground and the abutting homes?

Lake Frequented by Motorboats. Students can listen to the sounds of the motors and examine the water for oil and gasoline film. Students can seek answers to such questions as the first eight listed. Residents living on the shore can be interviewed, as can bathers and boaters.

Historic Site, Park, or Other Natural Environment Areas Requiring Some Form of Transportation for Access. Students can seek answers to such questions as

Could the public enjoy this area without the availability of convenient, safe, and inexpensive transportation facilities?

What are the estimated costs of the facilities and modes of travel necessary to reach the area?

Who takes advantage of the facilities to visit the area? Do all citizens participate equally?

Section of Town Relieved of Traffic by the Construction of a Major Highway. Students can seek answers to such questions as

What were conditions like before the highway was built?

What specific benefits has the highway provided the neighborhood--for example, fewer cars? More safety? Less pollution? Greater privacy?

Did the highway encroach on parkland? Did it replace residences?

Facility Responsible for Fire Fighting, Crop Spraying, Forest Seeding, Insect Control, Weather Control, or Garbage Collection. Students can learn the ways in which the vehicles or facilities benefit the environment by going along to observe when fire fighting, garbage collection, etc. take place.

Rural Highway. Students can ask rural dwellers

Did the highway cut off farmlands?

Did it allow greater speed in delivery of crops and supplies to and from farmers?

ACTIVITY #18

Mini-unit Topic: Observing Interrelationships

Approximate Class Time: 1½-3 periods, plus out-of-class time

Capsule Activity Description: Students research the extent to which automobile service facilities consume land and provide employment in their community.

Goal:

To be aware of the extent to which automobile travel requires land use in the local community.

Concepts Treated:

- Highways, roads and other facilities that make automobile travel possible consume a large percentage of land in the average community.
- Highways, roads, and other facilities that make automobile travel possible also provide considerable employment in the average community.
- Citizens need to assess the relative advantages and disadvantages of using local land space for automobile travel instead of putting the land to other uses.

ACTIVITY

Small groups of students research the extent to which automobiles and facilities that service cars take up land in their community.* Groups also determine the employment opportunities such property provides.

Groups begin by identifying facilities that are used for servicing automobiles. Examples include gas stations, highways and roads, parking lots and garages, new and second-hand car stores, car washes, bridges, and rotaries. Groups obtain maps of the community and divide the city into sections on it for each student to study. Students develop a labeling system so that each student labels gas stations on the map as, for example, "GS," and so on.

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*Students can also research the extent to which airports and mass transit facilities take up land and provide employment in their community.

Next, students research how much land is used by each facility and how many jobs it provides. Students conduct the study by visiting assigned sections of the community taken by automobile service facilities, and recording the number of people employed at each facility.

After the study has been completed, groups develop a composite map of the community in which all areas that are used for servicing automobiles are shaded, indicating clearly what percentage of the community is left for nonautomotive purposes. Groups then compare results with the national averages for cities: 1/3 of the land area of cities is used by businesses catering exclusively to the automobile; 1/3 is used by roads and highways.

Then the students indicate, beside each shaded area on the map, how many people are employed at each facility. Students calculate what percentage of all local jobs is represented by these auto-related jobs. Students compare this percentage with national figures: 16 percent or one out of six of all jobs stem from the automobile.

Groups then assess the relative advantages and disadvantages these facilities provide the community by examining four major considerations:

1. What basic transportation services do the facilities provide the community in terms of commuting, recreation, shopping, goods movement, and other necessities and amenities? Do these facilities, in the process, displace other workers?

2. What employment opportunities do these facilities provide, and could the persons employed by them find jobs elsewhere?

3. Could the land, or parts of it, currently used for automobile travel and support services be profitably put to other purposes (such as parks, trees, housing, open space, or sports facilities)? Could these other uses provide jobs for any or all of the people currently employed by the automobile-related facilities? Would these new jobs provide each worker with the same income? How many workers would have to be retrained for the new jobs? Who would pay for the retraining?

4. Does the community want local land use and local jobs to be revised in this manner? (Students can conduct a poll in the community to determine local sentiment on this issue.)

Groups prepare and present a report on their findings and respond to comments and questions from you and the rest of the class. At this point (if the students have not already done so spontaneously) you can have the class discuss how many of them hold or have held jobs provided by transportation and how many of them have taken advantage of automobile-related facilities in their neighborhoods.

Evaluation Method:

Students advocate or oppose the taking of more land in their community for automobile or highway purposes in mock editorials for the local newspaper.

Variations and Supplementary Activities:

Students can indicate automobile-related services, like movie drive-ins and car hops, on their maps.

Students can research what, if anything, was destroyed to make way for the facilities servicing automobiles.

ACTIVITY #19

Mini-unit Topic: Observing Interrelationships

Approximate Class Time: ½-1 period

Capsule Activity Description: Students discuss ways in which features of the environment can create obstacles that interfere with travel safety, convenience, and enjoyment.

Goal:

To know how features of the environment can hamper travel safety, convenience, and pleasure.

Concepts Treated:

- The environment can create obstacles which hamper travel safety, convenience, and enjoyment, or it can facilitate them.
- Students need to identify types of citizen participation the public can engage in that will help balance the needs of transportation and the environment when the two conflict.

ACTIVITY

Conduct a class discussion on how features of the environment can interfere with travel safety, comfort, and pleasure. Focus on four areas of concern:

1. The concept of creating harmony between transportation and the environment
2. Ways in which features of the environment can affect travel safety, convenience, or enjoyment
3. Laws relating to features of the environment that affect travel
4. Methods by which citizens can reduce the impact of features of the environment that interfere with travel safety, convenience, or pleasure

Begin the discussion by pointing out that we commonly think of transportation and the environment only in terms of how transportation harms the environment whereas there are significant ways in which features of the environment can create obstacles to safe, pleasant, and comfortable travel. The goals of the citizen and of the government should be to identify the ways in which transportation and the environment affect *each other* and identify and support methods by which they can live together in harmony. This means that there will be times when transportation must be controlled or reduced to avoid or minimize some of its harmful effects on the environment, but also times when features of the environment must be altered so they do not hinder travel safety, convenience, and enjoyment. Conclude this introduction to the activity by reminding students that the concepts of "transportation" and "environment" must be interpreted broadly if harmony is to be promoted to the fullest extent possible. "Transportation" refers to the use and purchase of transportation goods and services, whereas "environment" includes all man-made artifacts as well as the natural surroundings.

Then ask the class for examples of how features of the environment might hinder travel safety, convenience, and enjoyment. Ask the students to think of examples when they have been driving of some part of the environment that interfered with their ability to operate a motor vehicle as they would have liked. Examples of such environmental features you can use to supplement the students' suggestions follow:

- *Commercial signs and billboards* can spoil scenery, reduce travel pleasure, and create distractions for drivers.
- *Automobile graveyards* can have the same effects.
- *Litter* can have similar effects and, in addition, create safety hazards for drivers and passengers in vehicles that swerve to avoid, or skid on, litter.
- *Distractions* along roads and highways--such as sunbathing areas, drive-in movie theaters with screens facing the highway, and athletic fields--can cause accidents.
- *Interferences with visibility*, such as trees, tree limbs, bushes, and hills, can cause accidents.

Next, ask the class to indicate what laws, if any, should be passed to prevent these features of the environment from interfering with travel and present some of the legislation that now exists in this area, such as the Highway Beautification Act which regulates junkyard locations (see "Readings on Transportation and the Environment" later in this chapter). In addition, other provisions of that act prohibit billboards within 660 feet of the right-of-way of Federally-aided interstate and primary highways outside commercial and industrial areas. The Federal-aid Highway Amendments of 1974 extend Federal control over outdoor advertising by prohibiting those signs, displays, and devices "erected beyond 660 feet from the right-of-way, located outside of urban areas, of such size as to be visible" and "erected with the purpose of their message being read from such main traveled way." The act provides for just compensation for the removal of the advertising lawfully erected under state law. Using $100 million in funds from the Federal Highway Administration, the states removed 321,000 billboards from the nation's highways between 1971 and 1974.

Conclude the discussion by asking students to suggest ways in which citizens could become involved in reducing the environment's effects on transportation so that transportation and the environment can live in harmony. It will be useful at this stage to point out that all citizens can accept personal responsibility for their own *individual* actions--and that some citizens will want to go further and involve themselves in participatory actions on a community level. Examples of personal and participatory citizen actions are provided in the activities in the remaining three mini-units in this chapter. Specific types of citizen participation you can present include keeping lakes and rivers free from pollution to ensure that recreational boaters are not disturbed by unsafe objects in the water and by visual unsightliness; not littering highways and waterways and encouraging others not to; discussing with neighbors ways in which their trees, bushes, etc. can be pruned or replanted if they present visual obstructions to automobile travelers, bicyclists, or pedestrians; pointing out to the proper authorities any violations of Federal or local laws regarding the environment; and participating in highway planning so that roads are built in ways that promote travel safety, convenience, and enjoyment.

Evaluation Method:

Students select an appropriate feature of the environment in their community and describe how it hinders travel safety, convenience, or enjoyment.

Variations and Supplementary Activities:

Students can engage in one or more of the suggested citizen activities to eliminate a feature of the environment that hampers travel safety, convenience, or enjoyment.

Students can interview highway officials and departments of transportation officials on ways in which features of the environment hamper travel and on what citizens can do to maintain harmony between transportation and the environment.

Students can research and discuss how effective the provisions of the Highway Beautification Act have been in removing billboards from highways and what obstacles may have and still may be delaying full implementation, such as foot dragging by states, opposition by the tourist industry, the reluctance of the sign-producing industry to cooperate in establishing a quick cost-assessment system, and lack of concern on the part of the public and environmental groups.

MINI-UNIT 6

STUDYING PROBLEMS AND SOLUTIONS RELATING TO CONFLICTS BETWEEN TRANSPORTATION AND THE ENVIRONMENT

The nature of problem solving is always a key issue in social dilemmas, and conflicts between transportation and the environment are no exception. The need for more and better travel vehicles and facilities often conflicts with the critical importance of protecting the environment. In turn, desirable features of the environment often hinder traveling safety, convenience, and enjoyment.

This mini-unit helps students identify typical conflict areas between transportation and the environment, methods for resolving them, and agencies and groups that can contribute to their resolution. The unit does not attempt to cover every possible conflict or resolution--an impossible task; rather, it focuses on a few examples of such conflicts and engages students in the *process* of conflict resolution so that, armed with this skill, they can later turn their attention to resolving the variety of conflicts that will confront them in the area of transportation and the environment--or which they currently are struggling to resolve.

This unit also treats the following key concepts:

- The concept of "transportation" includes not only vehicles but also the facilities, such as highways and airports, needed to service vehicles.
- The automobile has many major indirect effects on the environment, some of which are beneficial and others of which are harmful.
- Although there are significant harmful effects that highways have on the environment, people also need to be aware not only of the ways in which highways improve travel safety, speed, and convenience, but also of the role of highways in providing jobs and stimulating the economy.
- A major solution to conflicts between transportation and the environment lies in government action to resolve such problems.
- Citizens need to be aware of solutions to situations in which they are personally inconvenienced or endangered by transportation effects on the environment or by features of the environment that interfere with travel safety, convenience, or enjoyment.

This unit can serve as an introduction to the following unit, which focuses on one particular solution to conflicts between transportation and the environment--that of transportation planning. However, this unit can also be used independently as a discrete unit of study.

MINI-UNIT 6 LESSON PLAN

Studying problems and solutions relating to conflicts between transportation and the environment

Activity #	*Activities*	*Class Time*
20	DESCRIPTION: Students read and evaluate accounts of transportation's effects on the environment. GOAL: To know what the major effects are that transportation can have on the environment.	1-2½ periods, plus out-of class time
21	DESCRIPTION: Students discuss the automobile's indirect effects on the environment. GOAL: To know what indirect effects automobiles have on the environment.	½-1 period
22	DESCRIPTION: Students discuss and role-play personal actions citizens can take to reduce the harmful effects of transportation vehicles and facilities on the environment. GOAL: To know what actions individuals can take in their personal travel behavior to reduce the adverse effects of automobiles on the environment.	1½-2 periods
23	DESCRIPTION: Students discuss and evaluate actions the government is taking to reduce transportation's harmful effects on the environment. GOAL: To know how the government is attempting to balance the needs of transportation and the environment.	½-1 period

MINI-UNIT 6 LESSON PLAN (CONTD.)

Studying problems and solutions relating to conflicts between transportation and the environment

Activity #	*Activities*	*Class Time*
24	DESCRIPTION: Students discuss solutions to conflicts between transportation and the environment. GOAL: To be able to resolve conflicts between transportation and the environment.	1-3 periods

Total Class Time: 4½-9½ periods.

ACTIVITY #20

Mini-unit Topic: Studying Problems and Solutions

Approximate Class Time: 1-2½ periods, plus out-of-class time

Capsule Activity Description: Students read and evaluate accounts of transportation's effects on the environment.

Goal:

To know what the major effects are that transportation can have on the environment.

Concepts Treated:

- Transportation has many harmful and beneficial effects on the environment.
- Although there is general agreement among most experts on what the major harmful and beneficial effects of transportation are, there are many shades of opinion concerning details.
- The concept of "transportation" includes not only vehicles but also the facilities, such as highways and airports, needed to service vehicles.

ACTIVITY

Begin the activity by indicating that different people probably have different ideas in mind when they refer to "transportation and the environment" and that if the class is to study the topic it has to agree on what this field of study constitutes. Ask students for definitions of the words "transportation" and "environment." For example, "transportation" might be defined as

> the process of moving people and products, including the vehicles used for carrying them *and* the facilities necessary to service these vehicles (such as gas stations, highways, airports).

"Environment" might be defined as

> all the man-made and natural objects and conditions that can affect and be affected by transportation, including energy resources, pollution, and land use.

Following this definitional exercise, indicate that the benefits transportation has conferred on society have been striking. Then point out that some of these benefits--as many class members are probably aware--have included enhancing the environment and making it possible for citizens to appreciate the environment, from cleaning up garbage to providing access to wilderness areas.

Indicate that transportation has also had harmful effects on the environment, and it is primarily these deleterious consequences which make a study of the field of transportation and the environment so important.

After this background discussion, assign each student to read and take notes on one of five readings on transportation's effects on the environment such as the literature suggested in the Bibliography. Have each selection read by about one fifth of the class. Tell the class to look for the specific effects transportation use and facilities have on the environment, including pollution, energy depletion, land use, population movement, and beneficial effects.

Upon completion of the reading, break the class into small groups in which no two students have read the same assignment. Give the groups written instructions to discuss the following questions:

- Which effects are mentioned by at least two sources?
- Which of these effects, if any, have members of the group personally observed?
- What transportation vehicle(s) and/or facility(ies) is responsible for each effect?
- Which effects are beneficial and which are harmful?
- Which harmful effects are serious or potentially serious?
- Where does the danger of the harmful effects lie--e.g., to health, to natural resources, to demographic patterns?
- How can citizens balance the harmful and beneficial effects in terms of whether the sources of the harmful effects should be regulated?

Have each group report its conclusions to class and respond to questions and comments from you and the other groups.

After students have exhausted their ability to identify effects from the literature and personal experience, you can supplement their efforts with the following:

Examples of transportation's *harmful effects* on the environment include air pollution, noise pollution, visual unsightliness, water pollution, litter, land misuse, energy consumption and depletion, displacement of people and businesses, and junk--solid waste disposal problems. Examples of how use of transportation can *benefit* the environment include reducing stop-and-go traffic, providing access to parks, historic sites, natural environment areas, etc., fighting forest fires, crop spraying, facilities for viewing scenery, garbage collection, airlifting food to stranded livestock, forest seeding and fertilizing, weather control, insect control, pollution monitoring, and visual attractiveness.

Evaluation Method:

Students list those beneficial and harmful effects transportation vehicles and facilities can have on the environment about which there appears to be a consensus in the literature. Students also list those effects that appear to be controversial in terms of whether they occur or whether they are beneficial or harmful. Finally, the class evaluates the extent to which individuals can rely on their personal experience to become aware of how transportation vehicles and facilities benefit and damage the environment.

ACTIVITY #21

Mini-unit Topic: Studying Problems and Solutions

Approximate Class Time: ½-1 period

Capsule Activity Description: Students discuss the automobile's indirect effects on the environment.

Goal:

To know what indirect effects automobiles have on the environment.

Concepts Treated:

- The automobile has many major indirect effects on the environment, some of which are beneficial and others of which are harmful.
- The most important indirect effects of automobiles on the environment are those caused by highways and roads.
- While highways have significant harmful effects on the environment, people also need to be aware of the ways in which highways improve travel safety, speed, and convenience and the role of highways in providing jobs and stimulating the economy.

ACTIVITY

Although most of your students will be drivers who have experienced or observed some of the direct effects automobiles have on the environment, many of the pupils may not have realized the extent to which *facilities* serviding automobiles also have major impacts on the environment. In this activity, students in small groups identify and evaluate these indirect effects of the automobile on the environment. Before the activity begins, have the students write their responses to the scenario provided at the end of the activity. Then break the class into small groups and give each student written instructions to read each other's papers and to then perform the following assignments:

1. List the items you wrote about that exist solely or primarily for the support of the automobile. (Examples include gas stations, home garages, parking lots, signs, streets, and highways.)

2. Can you think of any other facilities that are needed to service the automobile?

3. Discuss the indirect effects that each facility has had on the environment in your community.

4. Discuss the role each facility plays in servicing automobiles.

5. Discuss how prevalent or widespread each of these facilities is--how many are there in your community?

6. Discuss these facilities in terms of (a) What positive effects, if any, do these facilities have on the environment? For example, are they interesting or attractive to look at (for example, well-designed bridges, aesthetically built highways, tastefully landscaped roads, architecturally appealing gas stations or subway stations)? Do they contribute to the cleanliness or orderliness of the neighborhood? Do they make possible or facilitate travel to parks, historic sites, or other natural environment areas? Do they remove traffic from the city? Do they involve garbage collection or crop spraying? (b) Are any of the facilities unpleasant to look at (for example, automobile junkyards, ugly or unclean gas stations, grotesque bridges, monotonous highways)? (c) Do any of the facilities discourage travelers from using less polluting forms of transportation? (d) Do any of these facilities present dangers to the community (for example, injuries to children roaming the streets or junkyards, visibility hazards, distractions to drivers)? (e) Are there other important uses the land occupied by these facilities could be put to in most communities (for example, parks, playgrounds, housing)?

7. Discuss the advantages of these facilities *aside* from their necessity or desirability for safe, convenient, and pleasant automobile travel; for example, consider the jobs they provide, their potential stimulus to the national economy, and their role in national defense.

After the groups have completed their discussions, have each group present its conclusions to the class and respond to questions from you and from other groups.

Evaluation Method:

Students describe the indirect effects automobiles have on the environment in their own community.

Variations and Supplemental Activities:

Students can research the amount of time people spend commuting and what they do while commuting. Students can seek answers to questions such as the following:

How much time does the average commuter spend in his or her car?

Do commuters who travel by public transportation spend less time commuting?

Do commuters on public transportation use the time to relax, read, chat, etc.? Do auto commuters?

Does it appear that auto commuters could commute to work as well by public transportation as by car?

Have highways relieved the severity of any rush hour delays, traffic congestion, and pollution, or have they created traffic jams of their own?

Do automobile commuters have parking problems? If so, how are these handled?

Have any recent developments in transportation in the local community--highways, vehicles, facilities--facilitated commuting by making it safer, more convenient, or more pleasant?

Are there ways in which features of the environment affect--hinder or facilitate--commuting time, safety, and pleasure in terms of hampered visibility due to billboards or trees, or unpleasant vistas due to junkyards or billboards?

Students can research the effects of highway and road construction on the displacement of persons, businesses, and community facilities. Students can also research in their community examples of airports or mass transit facilities that caused displacement problems. Students can investigate who had to move; what compensation was provided, by whom, and according to what legislation; and what the effects of displacement were on the relocatees. Three sources of valuable information on the process of relocation are

Lane Acquisition Division, Office of Right-of-Way,
U.S. Department of Transportation, 400 7th and D
Streets, Washington, D.C. 20590

The Death and Life of Great American Cities, by Jane Jacobs

The Social and Economic Effects of Highways, Federal Highway Administration, U.S. Department of Transportation

Students can also interview relocation counselors from agencies with powers to acquire property.

Scenario

Imagine that you were flying from London to Australia last year and your plane crashed in the wilderness. You survived the crash and found your way to a large city in some foreign land. You were taken to a hospital, treated, and released. While waiting for the next stagecoach to take you over the mountains, you thought about something you had been struck by the moment you crashed in the country: there were no cars. Everyone traveled around by horseback, bicycle, and foot. You said to yourself, "If I could interest a car dealer in the U.S. to sell cars here, we could make a fortune!"

Much later, you were indeed able to persuade a car company to agree to sell small cars to Smogfree, the country you had crashed into. So the company sent you back to Smogfree to persuade the rulers to allow cars to be introduced. After some negotiations, Smogfree agreed to let cars be introduced--but on one condition. You had to become Minister of Automobiles in Smogfree and make sure that the country was *ready* to handle cars *before* any cars actually arrived.

The rulers of Smogfree are now giving you a free hand to do whatever needs to be done to get the country prepared for and able to handle a large number of cars. But these rulers have let you know that if the cars create any serious problems, you will be executed. You decide to stay and make your fortune.

You are now sitting down to plan what needs to be built and created in Smogfree to make it easy for the capital city and the rest of the country to accommodate cars.

What do you need to build in Smogfree to handle cars? What problems will cars create that you should plan for now?

ACTIVITY #22

Mini-unit Topic: Studying Problems and Solutions

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students discuss and role-play personal actions citizens can take to reduce the harmful effects of transportation vehicles and facilities on the environment.

Goal:

To know what actions individuals can take in their personal travel behavior to help reduce the harmful effects of transportation on the environment.

Concepts Treated:

- There are several positive actions the public can take in their own personal travel behavior to help reduce the harmful effects of transportation on the environment.
- There are effective methods by which citizens can often persuade friends, neighbors, and relatives to travel in ways that protect the environment and help conserve scarce energy resources.
- Increased use of public transportation and carpools can help reduce the harmful effects of automobiles on the environment.

ACTIVITY

Private citizens can in two respects take personal action to help reduce the harmful effects of transportation on the environment: they can alter their own travel behavior in appropriate ways and they can persuade others to do the same. The first part of this activity involves students in a discussion of the first approach; the second part has students role-play the second approach.

Begin by having the class write its response to the following scenario:

The mayor has just appointed you commissioner of transportation and the environment for your community. He has asked you to come up with a plan of action that lists the *actions individual citizens can take to reduce the effects of auto emissions on the environment and reduce the extent to which cars use up energy resources.* You have ten minutes right now in which to write a list of your recommendations.

Then break the class into small groups, instructing the members of each group to read each other's lists and discuss which actions they agree most citizens will voluntarily undertake and *why* they believe citizens would do so; which actions citizens could be motivated to undertake, and *how* they could be motivated to do so; and why some citizens will not take some promising actions.

Groups report conclusions to class and respond to questions and comments from you and the other groups. Raise for discussion any actions that students may have ignored, such as

1. Use public transportation whenever possible.

2. Use carpools and bicycles--and walk.

3. Maintain a car in optimum emission-reducing condition.

4. Use good driving habits, avoiding unnecessary emission-producing maneuvers (see suggested list at the end of the activity).

5. Buy unleaded gasoline.

6. Buy cars with the lowest levels of emissions.

As the second part of this activity, have students role-play persons objecting to a neighbor's, friend's, or relative's use of transportation. Sample role profiles are provided at the end of this activity.

After each role-play, have participants read their role profiles to the class and discuss the feelings they had while role-playing--in particular, "neighbors," "friends," and "relatives" discuss their emotional reactions to different approaches on the part of the "complainer"--which approaches made them more likely to discontinue the practice being objected to. Nonparticipants discuss what they would have said had they been involved.

Encourage the students to develop their own role profiles based, if desirable, on their own experiences driving automobiles, using public transportation, or participating in carpools.

After completing the role-plays, list on the blackboard the possible approaches citizens can use in seeking to influence other private citizens to discontinue harmful transportation practices.

Finally, discuss whether it is *appropriate* to object to other people's travel behavior on the grounds that it harms the environment and, if so, when and why.

Evaluation Method:

Students describe direct actions they can take in their personal lives that will help reduce transportation's harmful effects on the environment. Students also describe ways in which they might persuade other people to take similar actions.

Variations and Supplementary Activities:

Students outline personal plans for individual actions they will take to reduce the impact of transportation on the environment. Each student implements his or her plan for one week. During the next class period, each student reports on the experience of implementing the plan and explains why it is or is not feasible for him or her to adopt the personal plan on a long-term basis.

Students can role-play scenarios in which a citizen complains about a feature of the *environment* over which a friend or neighbor has control that is interfering with his or her travel safety, convenience, or pleasure. Students can use the final set of role profiles for this purpose and then develop additional ones of their own.

Students can research the railroads as a personal travel alternative to automobiles, seeking answers to such question as

1. What kind of passenger rail travel is available in our community?

2. How convenient would it be to use rail travel for different purposes in our community?

3. How expensive, compared to other modes of travel, would it be to travel by rail to reach various destinations?

4. How used (or underused) are the railroads in our community? If they are underused, what might account for this?

5. Is the community aware of the availability, convenience, and cost of rail travel? If not, should they be informed of it and, if so, how?

6. Do railroads have fewer adverse effects on the environment than cars? If so, in what ways?

Students can also research the advantages and disadvantages of public transportation as an alternative to automobile use for certain trips. The first chapter of this Manual provides several activities that can be used for such research.

Students can discuss and then poll then public regarding the advantages and disadvantages of forming carpools for certain trips. Examples of some of the positive and negative features of carpooling follow:

Advantages include reduced traffic congestion, conserved energy resources, greater chances for sociability, reduced need for street maintenance, participants' money is saved, and participants are saved frustrations associated with driving daily in traffic or long distances. *Disadvantages* include loss of privacy, loss of flexibility in terms of departure and arrival, increased time commuting in order to pick up other passengers, frustration of waiting for late passengers or embarrassment at leaving them behind, phone calls in cases of illness or other times when passenger or driver can't make the trip, discomfort of traveling with uncongenial passengers, and inability to run errands during lunch hour.

Sample Role Profiles

Noise

Complainer

Every summer you and your children like to swim in Placid Pond. It's a quiet, small pond, about ten acres in size. However, your neighbor is ruining your fun. He just bought a new motorboat which he takes out on Placid Pond and generally makes a racket. He makes sure not to endanger you when you and your children are swimming, but he still makes it miserable for you with the noise. You've decided he should go to a larger lake where other boats go, rather than disturb your little pond. You have gone over to his house this afternoon and have just sat down on his porch. What will you say?

Transportation user

You have just bought a new motorboat and what fun you are having with it! You take it out almost every day on Placid Pond for a spin. It's a very small lake, about ten acres, but you can't go to a bigger lake because you don't have a trailer to carry it. Besides, you like the quiet of Placid Pond, and the bigger lakes would have lots of swimmers and other boats to worry about. You suspect that your neighbors are annoyed by your boat, because some of them have given you dirty looks while they were swimming and you were driving around. One of your neighbors has just come over and sat down on your porch. You wonder if she is going to complain about your motorboat.

Car versus Bus

Complainer

You are the 14-year-old daughter of a mother who lives in the suburbs and works eight miles away in the city. You're upset with your mother because she drives all the way in town and back every day rather than take the bus. If she rode the bus, she would have to walk three blocks, wait five to ten minutes, and pay 50¢ one way. But that's not so bad--you do it every weekend when you go into town to the movies. And it costs your mother $3.00 a day to park her car in town. You think your mother is contributing to air pollution, wasting gasoline, and ruining her nerves in the traffic. You've finally worked up the courage to confront her about it. You have just sat down to dinner. What do you say?

Transportation user

You live in the suburbs with your husband and two children, a 14-year-old daughter, and a 17-year-old son. You drive to work in the city every day, even though it's an eight-mile drive, because you just hate to sit in those awful buses. Besides, you would have to walk three blocks to get to the bus and pay 50¢ each way. You'd rather pay the $3.00 a day to park in a lot in the city. You'd also have to stand and wait for each bus; they run only every 15 minutes during rush hour. Your daughter has made remarks to you once in a while about how you're wasting gasoline and how you come home complaining about the traffic. Now that you've just sat down to dinner, she looks as though she's going to really let you have it. How will you justify using your car if she complains about it?

Carpool

Complainer

You have joined a carpool at work in an effort to save gasoline and money. Many of the other people in the factory have done the same thing. It's even turned out to be fun! You get to chat with your co-workers on the way in and back, so the drive is more interesting than it used to be. But the guy who works at the bench next to you is still coming to work in his car, all the way from Hillville, 22 miles away. This really concerns you, because here you are doing your share to conserve gasoline and he's not. There are at least two other workers who could form a carpool with him, so you've decided not to keep your feelings to yourself. It's the morning coffee break and you have just approached him to suggest he join a carpool. What do you say?

Transportation user

You live in Hillville, a small town, and work about 20 miles away in a factory. You drive to work every day, even though many of your fellow workers use carpools. You drive your own car because you can't stand to wait for someone to come pick you up, to wait for people to get together before you can leave work, and to drive out of your way to pick up other people. Each trip would take about 15 minutes longer for you in a carpool. You'd also have to put up with the poor driving habits of some of your fellow workers. Anyway, as long as you pay for your gasoline, why should anyone care? But here comes that guy who works at the bench next to you who's always talking about his carpool. You wonder if he's going to say something about your not being in a carpool. He'd better not!

Complainer

Every winter morning your neighbor runs out of the house, starts his car, and runs back into the house for breakfast, leaving the engine running, until he's ready to go to work. You assume he does this either to get the heater working or to keep the engine from stalling when he drives away. What bothers you is that for five or ten minutes his exhaust is spewing out fumes that collect all around your house. You feel this is very unhealthy. You've finally decided to talk to your neighbor. You walked over this evening and have just sat down in his living room. What do you say?

Transportation user

Every morning in winter, before you go to work, you run out of your house, start your car, and run back into the house for breakfast, leaving the engine running. You do this to get the car warmed up so it won't stall when you take off and to get the heater working so you won't freeze. You know that a lot of fumes come out of the exhaust when you do this but only for a few minutes. Besides, you figure it's worse for you to be cold in the car than it is for a little carbon monoxide to get into the air.

Your neighbor, whom you have seen looking out at your car while it idles, has come over this evening and has just sat down in your living room. You wonder if he is going to say something about letting your car idle.

Safety

Complainer

You, Mr. (or Mrs.) Brown, noticed the other day that your neighbors, Mr. and Mrs. Green, have planted two four-foot hemlock trees on the corner of their property. In three years, you realize, the trees will be six feet tall. This concerns you because you have two small children who, in three years, will probably play in the street every now and then despite your best efforts to prevent this. The trees are going to make it very difficult for cars coming around the bend to see anyone in the street until it's too late. There are many small children in the neighborhood, and you feel certain other parents may share your concerns. You have discussed the problem over with your spouse and agreed to talk the matter over with the Greens. You spotted them this afternoon watering their trees and have walked over to see what can be worked out. Mr. and Mrs. Green have just given you a friendly "Hello!" What do you say?

Transportation User

You, Mr. (or Mrs.) Green, have been upset for some time at the noise the passing traffic brings into your home. You also have a lovely living room picture window that opens out on--the busy street. So you both decided to plant two baby four-foot hemlocks in your yard to improve the view, to keep people from looking into your living room, and, you hope, to keep out some of the sound. You bought and planted them five days ago and were told they would grow as much as a foot a year. You had considered buying bigger trees, but they were too expensive. Instead you spent $45 apiece on these smaller ones--still a big investment for you. You have noticed Mr. and Mrs. Brown, your neighbors, with their two small children, watching you as you water your trees. They seem upset, but you don't know why. In fact, Mr. (Mrs.) Brown is coming over right now as you water the trees. You like your neighbors and, wondering why they seem upset about your trees, greet them with a hearty "Hello!"

Getting the Best Mileage From Your Gasoline

After you have selected the gasoline with the octane rating and the additives you need, you can take several precautions to improve performance and save gasoline.

First, to improve performance, shop for a *good mechanic*--check with your friends and neighbors to see if they know one who is a specialist on your car. If you have your car serviced at a large agency, get acquainted with the service manager and see if you can have the same mechanic service your car every time. Be sure that a careful *service record* is kept on all repairs, so that the mechanic knows what work has been done before, and when. Follow the recommendations in your *owner's manual* for major and minor service and tune ups.

Second, to save gasoline and conserve energy, check your *tire pressure* at least once every month. Too low tire pressure increases rolling resistance, causes increased tire wear, and reduces gasoline mileage. Periodically have your mechanic check the *treadwear pattern* of your tires to see if they are properly aligned. If they are out of alignment, the tires will wear excessively and your gasoline mileage will drop.

If possible, *avoid pressing your accelerator* all the way down when climbing hills and long grades. It wastes gasoline. *Avoid excessive high speed* or jerky driving; learn to drive as smoothly and steadily as traffic and road conditions allow. *Turn off your engine* if you stop more than a minute. Restarting uses less gasoline than a minute's idling. Use the *brake* rather than the accelerator to hold your car in place on a hill. Avoid *jumpy starts*--they, and fast getaways, can burn over 50 percent more gasoline than normal acceleration. Avoid *weaving,* spurting, and lane changing in heavy traffic. Such practices waste fuel. *Look ahead* and pace yourself to minimize stops at traffic lights and jam-ups. *Slow down.* Excessive speed is the greatest waster of gasoline. For best mileage do not exceed 50 miles per hour. Limit the use of *auto air conditioners* and other fuel consuming accessories.

If you get a sudden drop in gasoline mileage, check with your mechanic. Trouble is brewing, and the sooner you have it fixed the less it is likely to cost you.

Before you buy a new car, ask the dealer how many miles per gallon you can expect. These figures are now available for most models. Reduce the number of unessential auto trips through careful trip planning. Use mass transit, carpools, or bicycles when feasible.

ACTIVITY #23

Mini-unit Topic: Studying Problems and Solutions

Approximate Class Time: ½-1 period

Capsule Activity Description: Students discuss and evaluate actions the government is taking to reduce transportation's harmful effects on the environment.

Goal:

To know how the government is attempting to balance the needs of transportation and the environment.

Concepts Treated:

- A major solution to conflicts between transportation and the environment lies in government action to resolve such problems.
- The government is already attempting to balance the needs of transportation and the environment.
- Citizens need to be aware of the government's attempts to balance the needs of transportation and the environment in order to evaluate them and encourage the government to alter or expand its efforts in this direction.

ACTIVITY

Ask your students if they, in their work or travel experiences, have come across examples of actions the Federal government is taking to reduce transportation's harmful effects on the environment. As automobile purchasers, for example, they may be familiar with the catalytic converters automobiles now have which are designed to reduce harmful exhaust system emissions.

You can then supplement the students' examples with the following ways in which the Federal government is seeking to balance the needs of transportation and the environment.

The government is *encouraging less reliance on automobiles* through carpooling and emphasis on mass transportation. Federal assistance for mass transit began in 1961 with an emergency loan program and a small test and demonstration program. In 1964 the Urban Mass Transportation Act established a program of Federal matching grants for preservation, improvement, and expansion of public transportation systems. Amendments to this act have provided broader program goals, higher funding levels, longer periods of assured Federal assistance, and greater flexibility in meeting local needs. Funding increased from $50.7 million in 1965 to $133 million in 1970 to over $1.4 billion in 1976 for the purchase and construction of mass transportation facilities.

The Federal Aid Highway Act of 1973 granted flexibility in the use of highway funds for public transportation purposes by opening urban system funds (previously targeted solely for highways) to transit, both rail and bus, and by opening all highway funds to exclusive lanes for buses, traffic control devices, bus shelters, parking facilities, etc. In addition interstate highway funds also were made available for nonhighway public transportation purposes under certain conditions.

Significant steps toward rehabilitating the nation's rail system are now being taken as the result of new legislation providing $6.4 billion in Federal aid to railroads. Key features in the law are the following provisions:

- Seven bankrupt Northeast and Midwest railroads are reorganized into the Consolidated Rail Corporation (ConRail), a freight railroad in which the Federal government is authorized to invest. The law provides $2.1 billion for the start-up of ConRail.

- The Department of Transportation will upgrade rail passenger service in the northeast corridor. The five-year program will cost $1.75 billion and will include improvements in tracks, stations, bridges, tunnels, signaling, and traffic control. In addition, there will be an expanded program of converting from diesel engines to electric engines: this will reduce pollution and save energy.

- A two-year program of subsidies is provided for bankrupt freight and commuter branch lines in the Northeast and Midwest. Without this subsidy program, these bankrupt lines could be discontinued because the new legislation has not made them part of ConRail. This provision offers 100 percent Federal financing for the first year of the subsidy and 90 percent for the second year.

- Another Federal program of assistance to branch lines is also established by the law, for a five-year period. This funding will be available to all states for the purchase or acquisition of bankrupt lines. This provision offers financing ranging from 100 percent for the first year to 70 percent for the fourth and fifth years.

A fact sheet presenting full details on all provisions of the Railroad Revitalization and Regulatory Reform Act of 1976 is available from Office of Public Affairs, Federal Railroad Administration, Washington, D.C. 20590.

The government is also creating *noise control legislation* to reduce excess noise from snowmobiles, trucks, and airplanes, and supporting and funding *highway beautification projects*.*

Specific examples of programs the government is undertaking or has completed to achieve these objectives include *grants* to cities, towns, and counties for the purchase of public transportation vehicles, such as buses--for example, a grant of $474,852 to the County of Hawaii to assist in the purchase of ten new passenger buses, bus signs, and related equipment, and *grants and contracts* to organizations to research the feasibility of a variety of energy-saving and environment-protecting modes of travel--for example, an award of $150,000 to the Massachusetts Institute of Technology to provide research on control procedures for Dial-A-Ride, a bus system in which people phone the bus system requesting the bus stop at their house. There are also *surveys* to learn how transportation facilities and vehicles can reduce negative effects on the environment--for example, a survey to determine the potential for increasing transportation energy conservation by strengthening international cooperative research programs. This is an attempt to learn from nations that long ago adjusted to the problem of a limited energy supply ideas that may be applicable in the United States. Interviews have been conducted with officials in France, West Germany, Sweden, Switzerland, and England.

Conferences, in which national experts or officials are gathered together to discuss solutions for some of transportation's harmful effects on the environment (for example, a national conference that was held on the railroads' role in meeting the nation's energy requirements--the two-day meeting brought together members of both public and private interest groups as well as the academic community), are also supported, as are *guidelines and requirements* for industry prescribing certain behaviors that will reduce transportation's effects on the environment--for example, the Federal Aviation Administration has recommended new ground operating procedures for jets at airports to reduce engine emissions and conserve fuel. It recommended that four-engine jets shut down one or two engines while taxiing to the terminal after landing or during protracted holds before takeoff. Three engine jets would shut down one engine.

Legislation has been passed to limit some of transportation's harmful effects on the environment--for example, a law requiring the installation of emission control devices on automobile exhausts and another reducing the speed limit to 55 mph. In another example, the Refuse Act of 1899 prohibits the throwing, discharging, or depositing of any refuse matter into the waters of the United States to a distance of three miles from the coastline. The Federal Water Pollution Control Act prohibits the discharge of oil or hazardous substances into the waters of the United States to twelve miles off shore. And boaters are required by law to notify the U.S. Coast Guard if their vessel or facility discharges oil or hazardous substances into the water.

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*See "Readings on Transportation and the Environment," later in the chapter.

Demonstration projects use government funds to learn about the feasibility of methods for reducing transportation's harmful effects on the environment--for example, a $600,000 carpool demonstration project in Los Angeles in which a computer program will provide computer-printed match lists to interested persons within a five-county area who fill out an application form. The project's goal is to remove 888,000 vehicles traveling the highways each day, save 170 million gallons of gasoline a year, and reduce by 71,000 tons the amount of pollutants put into the air in the area each year.

Efforts to *reduce the effects of* and the amount of *noise pollution* include passage of the Occupational and Safety Health Act, which establishes a framework for regulating any and all workplace hazards including excessive noise exposure. Under this act, the Department of Labor and the Department of Transportation have both established regulations for drivers of commercial vehicles in terms of hours of service and noise levels generated by the vehicles at the operator station. For example, certain regulations pertain to the use of hearing protection devices for ground crews around military and commercial aircraft. Public Law 90-411 authorizes the Federal Aviation Administration to establish noise standards for aircraft. Such standards have been issued for a variety of new aircraft, resulting in quieter wide body aircraft such as the 747, DC-10, and L-1011 plus the development of quieting kits for existing aircraft such as the 727, 737, DC-9, DC-8, and 707. Regulations are also being established (1974) to regulate ways in which all aircraft are to operate in the vicinity of airports to reduce noise exposure to adjacent communities. In addition, the Federal Highway Administration has established noise standards for the design and siting of all new interstate highways and for the design and approval of projects to reduce the noise from existing highways, and the Department of Transportation is directing research and development activities to demonstrate quiet trucks and quiet tires for all vehicles on the highways in order to reduce transportation noises.

Finally, discuss with students the following issues:

1. Does it seem that the Federal government's actions are effective? How can you tell?

2. Are there are actions the Federal government should be taking but isn't? If so, what are these actions? Why might the government not take these actions? What constraints may make it difficult for the government to take further action or to enforce the legislation it has enacted.

3. How can citizens help the Federal government take effective actions to reduce transportation's harmful effects on the environment--for example, by attending hearings, by sending their opinions to the government agencies and by getting involved in regional transportation planning efforts?

Evaluation Method:

Students describe the actions the Federal government is taking to resolve conflicts between transportation and the environment by role-playing dialogues between "newspaper reporters" and "government information officers."

ACTIVITY #24

Mini-unit Topic: Studying Problems and Solutions

Approximate Class Time: 1-3 periods

Capsule Activity Description: Students discuss solutions to conflicts between transportation and the environment.

Goal:

To be able to resolve conflicts between transportation and the environment.

Concepts Treated:

- Citizens need to be aware of solutions to situations in which they are personally inconvenienced or endangered by transportation's effects on the environment or the environment's effects on transportation.
- Many conflicts between transportation and the environment can be resolved in part or entirely.
- Citizens need to be aware of solutions to conflicts between transportation and the environment that have only general social effects and invisible (or tenuous) personal effects.

ACTIVITY

Below are five different mini-activities you can choose from for use with your students. You can implement one, several, or all of them. There is very little overlap in material covered in these mini-activities.

Game

Have students play a game in small groups or as a class in which they respond to hypothetical situations in which they are personally bothered by a transportation effect on the environment or by a feature of the environment that interferes with their ability to travel safely, conveniently, or enjoyably. Students select and defend solutions to the conflicts and are scored by other players on their choices and on their ability to defend their solutions.

You will need to duplicate class sets of the *solution cards, problem situation cards,* and *score sheets* so that each player receives a complete set (page) of eight solution cards and a score sheet. Each group of players also receives two problem situation sheets (two sets of eight problem cards). All these playing materials are provided at the end of the activity.

The game is played by groups of three or four students. Playing instructions are provided at the end of the activity. You will want to review them with the class before the game is played.

Variations and Supplementary Activities:

Students can develop their own problem situation and solution cards for subsequent game plays.

For each problem situation, students can discuss who *benefits* from the state of affairs and how they are benefited.

Debate

Have the class debate informally or discuss in small groups one or more of the issues presented below.

- Resolved, that the central business district should be off-limits to automobiles all day Sunday and from 10 a.m. to 3 p.m. weekdays.
- Resolved, that employees who ride to work in carpools should receive a tax rebate of 10 percent; should be provided with a special high-speed lane for faster rush-hour commuting; etc.
- Resolved, that 50 percent of all tax money from sales of gasoline and automobiles should be used to finance mass transit.
- Resolved, that gasoline should be taxed 100 percent; rationed; taxed and rationed; etc.
- Resolved, that all airports should be closed to air carrier traffic between 11 p.m. and 6 a.m.
- Resolved, that the government should provide free public transportation to encourage citizens not to use their cars.
- Resolved, that highway construction in the city reduces stop-and-go traffic and thereby reduces pollution.
- Resolved, that local community groups should not be allowed to veto new transportation facilities (highways, airport expansion, etc.) when the latter benefit the entire community.

- Resolved, that the state should ban billboards from the state; from all limited-access highways; etc.
- Resolved, that the speed limit for cars should be 40 mph; 60 mph; etc.
- Resolved, than an excise tax should be placed on large cars' sales prices; that large cars should be banned; etc.
- Resolved, that special lanes should be provided for buses; or cars with three or more occupants; or both.
- Resolved, that owners of automobile junk yards and graveyards should screen their operations from public view.
- Resolved, that billboard advertising along public highways should not be restricted.

Environmental Laws

Students can research and debate the provisions and effectiveness of environmental laws as they apply to transportation vehicles and facilities. Among the laws they can research and discuss are:

The Clean Air Amendments of 1970*

The Highway Beautification Act of 1965*

The Noise Control Act of 1972*

The Federal Water Pollution Control Act Amendments of 1972

The National Environmental Policy Act of 1969

The Freedom of Information Act

The Federal-Aid Highway Act of 1970 (Section 136b)*

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

Education

Students can discuss who should be responsible for educating the public about transportation's effects on the environment. Students can discuss which groups and agencies would be most effective and fair in educating and motivating the public and why; which of these groups have an obligation to educate the public; and what kinds of educational campaigns they should mount--be specific: if you select television, what kinds of programs should be shown, who should develop and pay for them, and how long should they run?

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*Explained in "Readings on Transportation and the Environment," later in this chapter.

Energy

Students can discuss several dilemmas between protecting the environment and developing additional energy resources. Sample dilemmas are provided below. Some involve events that have already occurred but can be discussed in terms of whether they *should* have occurred.

1. Suspension of the National Environmental Policy Act to allow construction of the Alaska pipeline

   Dilemma: Proponents of the Alaska pipeline say its construction will allow millions of barrels of oil from Alaska to flow to other states; without it, there is no economically feasible way to transport the oil to the rest of the country. Opponents of the pipeline say there is a real danger of a pipe leak, which could pollute millions of acres of land beyond repair, and that the technology needed to extract the oil will damage the land in Alaska.

2. Delay regulations controlling strip mining

   Dilemma: Proponents of strip mining claim tearing up and destroying thousands of acres of land is the only economically feasible way to locate certain coal deposits. Opponents of strip mining want to outlaw or regulate it because it destroys so much land and can cause landslides.

3. Allow off-shore oil drilling and prospecting

   Dilemma: Proponents of drilling for oil deposits in the ocean near the coastlines argue that there are unknown deposits of badly needed oil there and that we cannot afford to leave this source untapped. Opponents argue that off-shore drilling runs the risk of polluting the water and coastline with oil leaks and destroying marine life and beaches.

4. Delay in enforcement of Clean Air Act of 1970, which requires reduced exhaust emissions from all motor vehicles

   Dilemma: Proponents of delaying or eliminating provisions of the Clean Air Act, which requires motor vehicles to limit their carbon monoxide, hydrocarbon, and other emissions through the installation of pollution control devices, claim that such devices reduce the number of miles cars can travel on a gallon of gas. Cars must therefore use more gasoline per mile traveled. Opponents of nullifying the Clean Air Act argue that without it auto emissions will continue to pollute the air, causing serious health problems.

Dilemma: Proponents of reducing or eliminating provisions of the Clean Air Act that require the removal of lead from gasoline feel that this reduces the amount of gasoline available for automobiles. Opponents of leaded gasoline argue that lead emissions from cars endanger health.

Evaluation Method:

Students identify a local conflict between transportation and the environment present in their own community and develop a solution for it that satisfies the rest of the class.

Directions for Game Play

1. First time the game is played, players paste the two sets of cards onto cardboard or other solid backing material and then cut out the cards. Each group of players should have a page or set of *solution* cards for each player and two pages or sets of *problem* cards for the entire group.
2. Shuffle the problem cards and leave them face down in a pile.
3. Each player should have a complete set of eight solution cards.
4. Each player carefully reads all his solution cards.
5. Players match fingers to see who goes first.
6. First player takes the top problem card and reads it aloud. The player whose turn it is is known as the "problem solver." He then has two minutes in which to decide which of his solution cards he will apply to the problem he faces. He may use each solution card only once. He may use only one solution card each turn. After he has used a solution card and his turn is over, he must discard it.
7. When the player has decided which solution card to apply to the problem he faces, he has three minutes in which to explain to the other members of his group the nature of the problem he faces; what *exactly* he would do; why he feels he has a right to take action; and why he thinks his solution would solve his problem. If a player uses his "Do nothing" solution card or the "No right to take action" card, he must explain *why* he thinks there is no solution to the problem or *why* he feels he is not entitled to take action.
8. After explaining his solution for three minutes, any player in the group may ask the problem solver one question about his solution. The problem solver may take one minute to answer each question.
9. When the problem solver has answered each question, each of the other players fills out a *score sheet*, rating the problem solver's solution on the basis of practicality/feasibility (could the solution actually be carried out?), effectiveness (would the solution actually solve the problem?), and justification (does he have the right to take action?).
10. Play proceeds clockwise until every player has had three turns or until a period of time decided on in advance by the teacher or players has passed.
11. Player with greatest number of points at end of game is winner. (*Option:* Totals for each of the three scoring categories can be totaled separately for each player to see if some players scored consistently high or low in one particular category. For example, a player may score high on effectiveness and low on ethics.)

Summary of Order of Play

1.	Pick a problem card	
2.	Decide on which solution to use	2 minutes
3.	Explain the solution to group	3 minutes
4.	Answer questions by group	3-5 minutes
5.	Fill in the score sheet	2 minutes

Approximate time for each turn; 13-15 minutes

Problem Situation Cards

You live on Pleasant Street, once a quiet, two-lane, tree-lined street in the suburbs. Pleasant Street has just been designated a truck route by the town because it connects two main highways, Routes 2 and 65. Now huge trailer trucks drive down the street from dinner time to early morning. You are afraid to let your children play outside after dinner, and at night the noise is unbearable. You have trouble hearing the TV, and your house shakes from the rumbling. What's your solution?

Your neighbors are planting two trees, which will make it difficult for cars to see your children when they play in the street. What's your solution?

You swim in a lake that has suddenly been invaded by a group of kids who use their motorboats late at night and make a terrible racket. What's your solution?

You live near the airport. The noise of planes taking off and landing every two minutes is deafening: it's difficult for you to have conversations during dinner or to hear the TV. And at night, the noise keeps your children from sleeping soundly. What's your solution?

The state is planning to build a highway through your town which will cut across your property and damage the view from your front windows. The Highway Department has agreed to pay you for the property they take, but not for any damage to your scenic view. What is your solution?

You work in the city and it's not easy to get another job these days. But about once or twice a month there is so much pollution in the air that your eyes water and you cough badly. You also get very nervous and upset driving home in the rush hour traffic and then are irritable for the rest of the evening with your family. What's your solution?

You live next door to the fire station. At all hours of the day and night the engines come out with their sirens wailing, often waking you up several times during the night. What's your solution?

There's a confusing directional sign in the fork in the road down the street that drivers see too late and so pull out of lane abruptly to change direction at the last moment. This is on your route to work, and you've nearly been hit twice by other cars. What's your solution?

Solution Cards

Personally talk to the person, group, or business responsible for your problem.	Find other people who have a similar problem and organize a group to take action. Describe what action you would propose.
Avoid the problem by: 1. Moving away 2. Covering your ears 3. Changing your place of work or recreation 4. Driving a different route 5. Other action (say what kind) (Pick only one solution.)	Do nothing. You have no right to take action. (Why not?)
Find out if any laws are designed to solve the problem and initiate legal action 1. To stop the activity 2. To get money (compensation) (Pick one or more purposes for the legal action.)	Do nothing: the problem can't be solved. (Why not?)
Have a petition signed and present it to the responsible politician, agency, neighbor, or company. Describe what the petition would say.	Any other realistic solution of your own choosing.

Score Sheet for Solution Game

Give players one to five points for *each* type of rating according to the following scoring scheme:

Poor:	1
Below average:	2
Average:	3
Good:	4
Excellent	5

Player:________________________		Player:___________________________	
Practicality score:	____	Practicality Score:	____
Effectiveness score:	____	Effectiveness score:	____
Justification score:	____	Justification score:	____
Total score:	____	*Total score:*	____
Player:________________________		Player:___________________________	
Practicality score:	____	Practicality score:	____
Effectiveness score:	____	Effectiveness score:	____
Justification score:	____	Justification score:	____
Total score:	____	*Total Score:*	____
Player:________________________		Player:___________________________	
Practicality score:	____	Practicality score:	____
Effectiveness score:	____	Effectiveness score:	____
Justification score:	____	Justification score:	____
Total score:	____	*Total score:*	____
Player:________________________		Player:___________________________	
Practicality score:	____	Practicality score:	____
Effectiveness score:	____	Effectiveness score:	____
Justification score:	____	Justification score:	____
Total score:	____	*Total score:*	____
Player:________________________		Player:___________________________	
Practicality score:	____	Practicality score:	____
Effectiveness score:	____	Effectiveness score:	____
Justification score:	____	Justification score:	____
Total score:	____	*Total score:*	____
Player:________________________		Player:___________________________	
Practicality score:	____	Practicality score:	____
Effectiveness score:	____	Effectiveness score:	____
Justification score:	____	Justification score:	____
Total score:	____	*Total score:*	____

MINI-UNIT 7

STUDYING TRANSPORTATION PLANNING AS A MEANS OF PROMOTING HARMONY BETWEEN TRANSPORTATION AND THE ENVIRONMENT

This mini-unit is a logical follow-up unit to the previous one on identifying solutions to conflicts between transportation and the environment. This mini-unit focuses in depth on one particular method of resolving such conflicts--transportation planning, carried out by professionals and with the participation of concerned citizens.

The unit is designed to help students recognize that it is important for citizens to participate in transportation planning to help promote an appropriate balance between the often conflicting needs of transportation and the environment. The unit also explores the opportunities that exist for the interested citizen to participate in transportation planning and thus to have an impact on decisions that may result in harmful or beneficial consequences for the environment.

A final key concept the unit addresses is that transportation planning to resolve conflicts between transportation and the environment will be effective only if criteria are established for determining what is important about transportation and the environment.

MINI-UNIT 7 LESSON PLAN

Studying transportation planning as a means of promoting harmony between transportation and the environment

Activity #	*Activities*	*Class Time*
25	DESCRIPTION: Students discuss what environmental criteria should be considered in transportation planning designed to promote harmony between transportation and the environment. GOAL: To be knowledgeable about several criteria transportation planners should consider in planning new or expanded transportation facilities.	1-2 periods
26	DESCRIPTION: Students research the value of citizen participation in transportation planning and methods for participating. GOAL: To be aware of the importance of and opportunities for citizen participation in transportation planning.	2-4 periods, plus out-of-class time

Total Class Time: 3-6 periods

ACTIVITY #25

Mini-unit Topic: Studying Transportation Planning

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students discuss what environmental criteria should be considered in transportation planning designed to promote harmony between transportation and the environment.

Goal:

To be knowledgeable about several criteria transportation planners should consider in planning new or expanded transportation facilities.

Concepts Treated:

- Transportation planning to resolve conflicts between transportation and the environment will be effective only if criteria are established for determining what is important about transportation and the environment.
- Criteria for transportation planning to balance the needs of transportation and the environment must consider both the beneficial and harmful effects of transportation on the environment and also the effects of features of the environment on travel.

ACTIVITY

During the first class, have your students write their responses to the following scenario:

> You are the state commissioner for environmental protection. The governor wants to build a new airport near the state capitol. But first she needs to know from you what environmental concerns and issues she should be aware of before she builds it. For example, should she think about the problem of noise pollution? She doesn't want you to solve these problems, she just wants to know *what the problems are.* Interpret "environmental" as broadly as possible--all the possible effects, good and bad, a new airport could have on the community.

During the following class period, break the students into small groups and give them written instructions to

1. Compare the environmental concerns and issues each student said should be considered in building a new airport.

2. Discuss which ones should be considered as concerns in transportation planning *in general*--building highways and roads, truck terminals, mass transit facilities, etc. (It may be helpful for students in thinking of these concerns to imagine what environmental issues they would want to consider if they were building a bus station, highway, parking garage, truck terminal, harbor, or dock.)

Have each group report on all the concerns it listed, including those considered for the airport-building project as well as other projects, such as highways, garages, truck terminals, etc.

Then, during a full class discussion, guide students to develop a list of environmental criteria that should be considered in transportation planning in general. It may be necessary for you to help the students to make the transition between discussing transportation issues or concerns and identifying transportation planning criteria. For example, the specific concern about the taking of homes by eminent domain for a transportation facility will lead to establishing the more general criterion of what type of land it is appropriate to take for a transportation facility.

Some of the criteria on the list developed by the class might be

1. How many people are negatively affected versus how many people will be benefited.

2. How serious are the negative effects? How beneficial are the positive effects?

3. Are there any opportunities for those affected to avoid the negative effects?

4. Will there be negative effects on the natural environment--for example, on wildlife, open space, plants, trees?

5. Will there be negative effects on through traffic near the new airport site?

6. Can major changes in land use around the proposed site be anticipated?

7. Are there potential long-range dangers (weather modification, health, ecological balance)?

Evaluation Method:

Students identify and defend the appropriateness of sample criteria planners should use in deciding what transportation facilities to construct or renovate.

Variation and Supplementary Activity:

Another approach to this activity is to have your students focus only on one project. Ask them to pretend they are in charge of planning an airport for their community. Have them imagine what concerns they would have about the airport's effects on the environment. Record these concerns on the blackboard and then help the class to generalize from these concerns so as to develop a set of general environmental criteria transportation planning should consider.

For example, if a student suggests he or she would be concerned in planning an airport about noise pollution from landing and departing planes, point out that this involves an environmental criterion of determining and considering a transportation facility's *noise impact on citizens*. Other important environmental criteria to discuss are expected and potential air pollution (e.g., expected pollution from cars using a new freeway, potential air pollution in the atmosphere from supersonic aircraft); destruction of scenic land (e.g., clearing of parks, trees, etc., for a highway); displacement of persons (e.g., seizing houses by eminent domain for a new airport); effects on the general quality of life (e.g., reducing recreational areas through the construction of a crosstown expressway); effects on population shifts (e.g., encouraging more people to leave the inner city by facilitating transportation by suburbanites into the city on expressways); secondary effects of transportation planning (e.g., creation of parking problems in a city by building a new highway); and visual effects (e.g., billboards, unsightly construction of above-ground utility poles, traffic lights, litter).

ACTIVITY #26

Mini-unit Topic: Studying Transportation Planning

Approximate Class Time: 2-4 periods, plus out-of-class time

Capsule Activity Description: Students research the value of citizen participation in transportation planning and methods for participating.

Goal:

To be aware of the importance of and opportunities for citizen participation in transportation planning.

Concepts Treated:

- It is important for citizens to participate in transportation planning to help promote an appropriate balance between the needs of transportation and the needs of the environment.
- There are numerous opportunities for citizen participation in transportation planning.

ACTIVITY

In small groups students research the importance of citizen participation in transportation planning and opportunities for citizens to engage in transportation planning. Students start by examining the reading at the end of this activity. Then the groups engage in the following steps:

Groups first discuss among themselves the importance of citizen participation in transportation planning, such as

- The vastly greater effectiveness and reduced costs of preventing transportation problems before they occur rather than rectifying problems after they exist
- Procedures for providing citizens with opportunities for their particular concerns to be aired and considered about any transportation facility whose consturction is being planned

- Educating citizens to the need to become informed about the transportation planning process so they can learn about transportation planning issues and processes that will assist them to be effective contributors to transportation planning efforts (for example, learn about the critical importance of land use planning, zoning, and controlled growth in populated areas) and communicate with other transportation and nontransportation agencies and organizations in the community to help them prepare for and coordinate efforts and plans to accommodate the new transportation facilities that will be developed.

Groups then identify sources from which to learn more about opportunities for citizen involvement in transportation planning and how to participate effectively in such planning. Four major sources of information are literature (see the Bibliography); the readings "Process Guidelines for the Action Plan," "Public Hearings in Highway Planning," and "Pertinent Laws and Regulations Concerning Transportation Planning" (given in the later section "Readings on Transportation and the Environment"); and local, state, and Federal agencies--both literature they have to offer and interviews with key officials; and the reading on the following pages.

Groups divide up responsibility for the research and carry it out.

After completing research, each group develops a report on its findings and presents it to the class, responding to comments and questions from you and the other groups.

Evaluation Method:

Students identify a local issue related to transportation and and the environment and become involved in its solution. The final activity in this chapter suggests some types of citizen participation the students can engage in.

The Concerned Citizen and Transportation Planning*

This information is designed to help elected officials and interested citizens better understand and participate in the transportation planning and environmental impact assessment process.

The U.S. Department of Transportation (DOT) invites your active participation not only in official public hearings and review of project reports, but in the full transportation planning and environmental assessment process that should accompany any project. The full process, or parts of it, can be an effective forum for your participation. The process brings together representatives of local, state, and Federal agencies as well as technical experts from a wide range of fields and is an essential step in the decision whether to proceed on any major transportation project.

Though the focus of this information is on highway facilities, the matters considered relate to the broader transportation planning process and offer a useful point of departure for similar considerations with respect to other transportation modes.

Information gathered during the transportation planning and environmental assessment process can broaden your knowledge of your local area and can lead to the generation of new alternatives which better meet its needs. Thus, if you understand the planning process and constraints under which transportation decisions are made and become an active participant in the process, you will not only see the needs of your area more clearly--you will also be able to affect the ways in which those needs are met.

Does Public Participation Really Make a Difference?

It *can* make a difference--but only if you take advantage of the opportunities available to you.

First, you must decide for yourself when and how you want to become involved. This will probably depend on the amount of time you have available, your specific interests or concerns, and any special knowledge or expertise you might possess. If you are an elected or appointed official or represent an organized citizens' group, you may be eligible for inclusion on certain boards or advisory committees which may not be open to the general public. Nevertheless, even individual citizens with nothing more than a desire to understand how and why transportation decisions are made can easily find numerous ways to make meaningful contributions to the process.

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*From "Getting Involved In Transportation," developed by the U.S. Department of Transportation, Office of Environmental Affairs and the Office of Consumer Affairs. Based on materials prepared by Skidmore, Owings and Merrill (Boston) for the Office of Environment, Safety, and Consumer Affairs.

Second, you may want to choose between getting involved in specific project decisions or in broader systems planning and transportation policy decisions. Or if you have the time and interest, you may want to participate in both aspects of the transportation planning and decision-making process. In any event, the following discussion should help you figure out how to begin.

Participating in Project-level Planning

If your interests lie in specific project decisions--perhaps a proposed project that could affect your community or neighborhood--there are several ways to make your concerns known. For example, FHWA requires at least one and sometimes two public hearings on many Federal-aid highway projects. Another formal channel for public input is the opportunity to comment on a draft environmental impact statement (EIS).*

You may feel that the opportunity to attend public hearings and to comment on draft EISs comes too late. You may want to be involved earlier--and more deeply--in the actual project planning process. If so, this is often possible. This kind of participation is likely to be the most time-consuming option, but it is by far the most valuable way to influence planning decisions.

You will find several types of opportunities available to you. For the deepest possible involvement, you could seek out an appointment to an ad hoc community review panel or advisory committee. Many project planning studies include such groups, which monitor the sponsoring agency's technical study team and help decide what problems and issues will be studied and what alternatives will be developed for that project. Later, as environmental impact data are generated, these panels or committees help determine which impacts are most significant. They thus can have a strong influence on the direction and conclusions of the study.

On a less intensive basis, you could take part in a series of informal briefings and information meetings that might be held by the sponsoring agency to keep people informed as the study proceeds. Such meetings represent a middle ground between waiting for the public hearing or the publication of a draft EIS, and the creation of a project review panel which can directly influence the course of the study. You or your organization can take the initiative and call for such information meetings.

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*For details on both techniques of citizen participation, refer students to information provided in Activity 27.

Participating in Broad-scale Policy Planning

Opportunities for public participation are definitely not limited to studies dealing with individual projects. Transportation planning is a continuing activity, and decisions are being made in every region that affect future transportation and community development plans. In most areas a number of formal channels exist for citizen participation in this ongoing planning work.

Most regional and local transportation planning organizations have, or are in the process of creating, permanent citizen advisory committees. These groups differ in their rules for appointing members, the focus of their efforts, and the degree to which citizens influence the decision-making process. In general, however, their function is to advise transportation decision-makers at the regional and state levels on matters of policy and direction with respect to issues of areawide concern in transportation decision making. In so doing, these advisory groups and their individual members maintain close awareness of both general and specific transportation issues and can help direct or--if need be--redirect their area's transportation programs.

But whatever scale (state, region, or local) of transportation planning you choose, a first step would be to identify the planning organization or organizations in your area and to discover the opportunities for participation. One good way to become aware of local transportation issues in your area is simply to read the newspapers. Articles on local transportation matters can reveal the key actors, organizations, and agencies that you can contact for further information.

A Few Things to Remember

Get Involved Early. You will be better able to influence the final decisions if you have participated in, and understand, the early thinking and initial decisions made during the course of a project planning study or transportation policy analysis. Get on the mailing list, attend meetings, request appointment to the citizens advisory committee.

Know What You Want. The sooner you are able to state your ultimate goals clearly, the better you will be able to argue your positions--and to convince others that your arguments are right.

Understand the Applicable Laws and Regulations. Many laws and regulations govern the transportation planning and environmental assessment process. Some of the principal Federal laws and regulations are listed in the following pages.* Other state and local procedures may be in force in your area. Every one of them is a potential opportunity--and a potential pitfall. Find out as much as you can about when and how they apply.

Be Patient But Persistent. Meetings may last for hours; studies may go on for months, or even years. You may be bored by some people, incensed by others. (But remember, others may sometimes feel the same about you.) Sooner or later, important decisions will be made--you will have a say in those decisions only if you stick it out to the end.

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* See "Readings on Transportation and the Environment" at the end of this chapter.

Be Prepared. Know when meetings, hearings, and other important events are scheduled. Show up on time. Read the papers, reports and statements produced by other participants. Be ready to comment intelligently on the issues. Active and informed participation will win the respect, and perhaps the support, of other participants.

Encourage Others to Be Prepared. You should expect--and insist on--clearly presented information which thoroughly and accurately covers the subject. Continue to question staff and other citizens about vague or inaccurate statements they may have made until they provide a satisfactory response, promise to provide a response, or promise to provide one at the next reasonable opportunity.

Consider Forming or Joining an Ad Hoc Group. You may discover that there are other individuals who share your interests and may wish to work together as a group--sharing costs and efforts of letter writing and report analysis and continuing the discussion of issues outside the official meetings.

Know All Political Representatives Who Represent You. It is essential to stay in contact with your representatives by letter, phone, or visit. Make your views known to them and invite their participation. Be sure to know who the decision makers are and focus your efforts on them. If you are an elected or appointed official, be ready to provide your constituents with the information they need to become and remain active participants.

Don't Expect to Win Every Point. A truly participatory process will include many strongly held and widely divergent points of view. Not everyone will be happy with every decision. You are, however, entitled to fair and courteous treatment, a reasonable opportunity to present your case, and the expectation that your views--and the views of all other participants--will not be arbitrarily or summarily dismissed from consideration. Final agency decisions must be supported by written findings that clearly state the rationale for those decisions. And, of course, the sponsoring agency must fully comply with any other specific procedural steps defined by applicable laws and regulations. If you feel that any of these procedural safeguards have been ignored or misapplied, you can generally appeal to the courts for proper relief.

MINI-UNIT 8

INVESTIGATING CITIZEN PARTICIPATION TO RESOLVE CONFLICTS BETWEEN TRANSPORTATION AND THE ENVIRONMENT

Whereas Mini-unit 6 included actions citizens can take both in their own personal behavior and in their relationships with other people to help balance the needs of transportation and the environment, this mini-unit concentrates on *social and political actions* citizens can take to achieve this goal.

Citizen participation can be an effective method by which the public can help achieve socially desirable goals by assisting or motivating government agencies and private organizations and businesses to better harmonize interactions between transportation and the environment.

This mini-unit also focuses on the rationale for citizen participation in decision making that may affect interrelationships between transportation and the environment--why such action may be warranted and beneficial.

Two additional key concepts dealt with in the unit are the following:

- Citizens need to decide for themselves when it is appropriate to engage in citizen participation to promote harmony between transportation and the environment.
- Citizens need to develop the ability to identify methods the public can use to protest effectively imbalances between transportation and the environment.

In the final activity in the unit, students actually engage in a citizen participation endeavor, an experience that should motivate them to engage in other citizen participation ventures in the future and enable them to do so effectively.

MINI-UNIT 8 LESSON PLAN

Investigating citizen participation to resolve conflicts between transportation and the environment

Activity #	*Activities*	*Class Time*
27 Spirit Master #3	DESCRIPTION: Students discuss what kinds of citizen participation the public can engage in to balance the needs of transportation and the environment. GOAL: To know what types of citizen participation the public can engage in to promote harmony between transportation and the environment.	1 period
28	DESCRIPTION: Students role play scenarios in which community residents or groups protest harmful effects of transportation on the environment and adverse effects some features of the environment may have on travel. GOAL: To be aware of methods citizens can use to protest imbalances between transportation and the environment.	½-1 period
29 Spirit Master #3	DESCRIPTION: Students discuss when to engage in citizen participation to oppose a harmful transportation effect on the environment or a feature of the environment that interferes with travel. GOAL: To be able to decide when citizens should engage in citizen participation to oppose a harmful transportation effect on the environment.	1 period
30	DESCRIPTION: Students engage in citizen participation to reduce transportation's harmful effects on the environment or to alter hindrances to travel caused by features of the environment. GOAL: To know how to engage effectively in citizen participation.	2-6 periods, plus out-of-class time

Total Class Time: 4½-9 periods.

ACTIVITY #27

Mini-unit Topic: Investigating Citizen Participation **Approximate Class Time:** 1 period

Capsule Activity Description: Students discuss what kinds of citizen participation the public can engage in to balance the needs of transportation and the environment.

Goal:

To know what types of citizen participation the public can engage in to promote harmony between transportation and the environment.

Concepts Treated:

- Promoting harmony between transportation and the environment is often difficult.
- The public can engage in citizen participation that will effectively help balance transportation and the environment.
- Citizens need to decide for themselves when it is appropriate to engage in citizen participation to promote harmony between transportation and the environment.

ACTIVITY

Have students write what they would do to prevent the environmental problems described in one or more of the scenarios provided on Spirit Master #3.* (You can also have your students develop scenarios of their own based on their personal travel experiences or observations.) Tell

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*Since these scenarios are also applicable to Activity 29, you may want to save at least one scenario for use later with that activity. You should also be aware that all but one of these scenarios uses the story line from the role-plays provided at the end of Activity 28. However, using the scenarios with this activity *and* using the role-plays with Activity 28 will not detract from your teaching efforts because of the different instructional approaches these different activities use. Indeed, by discussing and role-playing the same story dilemma student learning may be reinforced, if similar ideas are expressed, and expanded, if new ideas occur during the role-plays that were not expressed during the discussions.

them for the time being not to consider whether they would or should take action but to focus exclusively on what actions they *could* take which would be *effective* in solving the problem presented.

Read aloud several of the students' responses and record on the blackboard in outline form the major actions the students indicated they could take. Next, discuss for one or more of the proposed types of citizen participation:

- *Why* they would be effective
- Whether they would be *appropriate and justifiable* actions to take and
- Whether they personally have been confronted with the dilemmas presented in the scenarios or with situations similar to these dilemmas and what, if anything, they did to resolve them and why?

Then ask the class to consider the merits and disadvantages of the following potential types of citizen involvement:

One can write letters or engage in petition campaigns directed at regulatory agencies (Federal, state, local), such as the Environmental Protection Agency (EPA), the Federal Aviation Administration (FAA), and Civil Aeronautics Board (CAB); politicians: Congressmen, Senators, executives (President, mayor, governor, town manager, etc.); local transportation agencies, such as: mass transit authorities, port authorities, departments of public works, departments of highways; state departments of transportation; local consumer protection agencies; media (TV, radio, newspaper) action lines; and letters to the editors of local newspapers. These campaigns and letters can be designed to achieve strong or stronger legislation on such issues as pollution controls for auto exhausts, strip mining, off-shore oil drilling, speed limits for cars, snowmobile use, auto traffic in the inner city, incentives for use of car pools, use of Highway Trust Fund and other sources for financing mass transit, high taxation or rationing of gasoline, closing airports after a certain hour in the evening, airport expansion, new highway construction, billboards, automobile litter, manufacture or purchase of large cars, mph minimums for autos, free or inexpensive public transportation, and construction of subways; they can also be aimed at strict enforcement of existing pollution laws, through fines, imprisonment, and enabling legislation.

One can engage in volunteer work with national or local environmental organizations.

One can create publicity to educate the public on issues suggested above, by means of advertisements, editorials, and feature articles in local newspapers, monthly city magazines, newsletters of community groups and unions, etc.; lectures; fact sheets, leaflets, etc.; demonstration projects; and radio and television public service announcements.

Once can give talks to clubs and organizations, e.g., fraternal societies (Elks, Masons, etc.), youth groups (Boy/Girl Scouts, etc.), and civic groups (Kiwanis, Rotary, etc.).

One can organize meetings with public and private officials and with government agencies and private companies to encourage them to adopt specific actions or discontinue current practices in order to reduce transportation's harmful effects on the environment.

One can publicize and organize actions at one's place of employment, (e.g, formation of car pools as company policy with an incentive system; provision of company shuttle bus to and from nearest public transportation facility during rush hour; subsidization of employee's transit fares or a fee for use of company parking facilities; provision of free parking only for carpool drivers).

*One can participate in transportation planning.** through such actions as becoming involved in the planning of Federal-aid highway projects or in the formulation of environmental impact statements.

Involvement in Federal-aid highway projects. The Federal Highway Administration (FHWA) works with state highway agencies to ensure that community organizations and individual citizens are actively encouraged to participate in the planning and design of Federal-aid highway projects.

Under the Federal-aid program, state highway agencies initiate, plan, design, build, and operate highway projects. (The FHWA provides financial assistance and guidance and is responsible for certain key approvals.) Each state highway agency has formulated a community involvement program--part of the state's action plan--which explains the procedures that are followed.

In addition to community involvement programs, each action plan explains how social, economic, and environmental factors are identified and studied, how the assistance of a wide range of professional skills is obtained and utilized, and how consideration of all feasible alternatives is assured in the highway planning process. Copies of action plans are available from state highway agencies or can be examined in their offices.

Action plan programs for community involvement include opportunities for interested citizens to participate in the planning and design process. In addition to public hearings, most states place emphasis on public meetings. Frequently such meetings are conducted as workshops, run with the assistance of local officials and agencies. In many instances coordination meetings are held with local officials prior to the public meetings.

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*For further information see the readings in this chapter and write for copies of *Getting Involved in Transportation* (U.S. Department of Transportation, Office of Consumer Affairs: 400 7th and D Streets, S.W., Washington, D.C. 20590) and *In Productive Harmony: Environmental Impact Statements Broaden the Nation's Perspectives* (U.S. Environmental Protection Agency: Washington, D.C. 20460).

Under state action plans, mailing lists are maintained to provide early notification and continued information to known interest groups and individuals. Concerned citizens may contact their state highway agencies and ask to have their names placed on these mailing lists.

Involvement in formulation of environmental impact statements. To ensure that environmental concerns and values are given systematic consideration equal to economic and technical considerations in the Federal decision making process, the National Environmental Policy Act of 1969 (NEPA) requires each Federal agency to prepare a statement of environmental impact in advance of each major action, recommendation or report on legislation that may significantly affect the quality of the human environment. Such actions may include new highway construction, harbor dredging or filling, nuclear power plant construction, large-scale aerial pesticide spraying, river channeling, new jet runways, munitions disposal, and bridge construction.

Each environmental impact statement must assess in detail the potential environmental impact of a proposed action, and all Federal agencies are required to prepare statements for matters under their jurisdiction.

The statement's primary purpose is to disclose the environmental consequences of a proposed action, thus alerting the agency decision maker and the public to the environmental risks involved.

The importance of the role citizens play in the impact statement process has been recognized by the courts. In many cases, the courts have upheld the right, or standing, of citizens to sue on environmental grounds.

One can participate in demonstrations, such as picketing, rallies, sit-ins, and boycotts.

One can initiate court action, such as civil actions against any citizens, government agency, or government for violation or failure to enforce existing legislation (e.g., the Noise Control Act of 1972 or the Clean Air Act of 1970) and injunctions, through class action or personal suits, against industries and government agencies who pollute or plan to build or operate facilities that will have adverse effects on the environment.

Also discuss what *constraints* citizens must expect to cope with in attempting to take action, such as the positive effects of transportation on the environment, the social and personal needs transportation meets, and the human and economic costs involved in reducing or eliminating transportation's harmful effects on the enviornment. The goal of citizen participation is to resolve conflicts and create harmony among the conflicting priorities of society, transportation, and the environment.

Conclude the activity by having the students identify the political and human constraints that might make difficult citizen participation to balance the needs of transportation and the environment. To the students' own list of constraints you can add the following limitations:

Groups or individuals may have *vested interests* against reducing harmful effects. Thus priorities in the expenditure of funds may result in lack of public funds for expensive but needed facilities such as public transportation. Other factors include lack of political or financial accountability by autonomous transit authorities and port authorities, etc.; lack of awareness and concern as well as disclaimers of responsibility by government agencies and businesses for the harmful environmental side-effects of their policies; buck-passing--claiming it is some other agency's or business' responsibility to police or clean up the environment; and claims by business or government that additional research is needed to verify the "alleged" dangers to the environment or to travel--placing the burden of proof on the environmental protection advocate or the automobile driver. In addition, industries and businesses for whom action would cost money may have powerful lobbies at all government levels; the press and media may be dependent on advertising by businesses to survive; and politicians may be reluctant to jeopardize campaign contributions from businesses or who have business interests of their own. Finally, lack of coordination among various government agencies and private businesses who could be involved in a unified program to reduce transportation's harmful effects and logrolling among legislators (willingness to vote for other legislators' bills in expectation of future reciprocal consideration) are also limitations.

Human factors that discourage citizens from taking action include not wanting to lose benefits transportation confers; laziness; ignorance about the seriousness of transportation's harmful effects on the environment, the environment's adverse effects on transportation, or of what action they can take to reduce those effects; fear of reprisal; indifference; lack of time; fatalism or cynicism--belief that no action they can take will improve the situation; and selfishness.

The *costs* of providing adequate public transportation are high. In terms of both equipment and labor, public transportation is often expensive to initiate and operate. Other budget items (for example, schools, fire protection, law enforcement) are often considered to have higher priority for funds.

Evaluation Method:

Students identify the major kinds of citizen participation the public can engage in to resolve conflicts between transportation and the environment, predict what the likely constraints might be that would make it difficult to resolve them, and identify potential means of overcoming those constraints.

ACTIVITY #28

Mini-unit Topic: Investigating Citizen Participation

Approximate Class Time: ½-1 period

Capsule Activity Description: Students role-play scenarios in which community residents or groups protest harmful effects of transportation on the environment and adverse effects some features of the environment may have on travel.

Goal:

To be aware of methods citizens can use to protest imbalances between transportation and the environment.

Concepts Treated:

- The public can engage in citizen participation that will effectively help balance the needs of transportation and the environment.
- Citizens need to develop the ability to identify methods the public can use to effectively protest imbalances between transportation and the environment.

ACTIVITY

Students role-play citizens or members of citizen groups who discuss with "government officials" and "business executives" reducing or eliminating harmful environmental effects associated with transportation and features of the environment which have adverse effects on travel safety, convenience, or enjoyment. Sample role profiles are provided at the end of this activity.*

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*Several of these role plays use the story lines from the scenarios which are provided on Spirit Master #3 for use with Activities 27 and 29. For this activity the scenarios have been expanded and cast into parts for two persons. In view of this repitition of plot, you may want to use only some of the role-plays at the end of this activity. However, using the role-plays for this activity *and* using the scenarios on Spirit Master #3 for the other activities will not detract from your teaching efforts because of the different instructional approaches these different activities use. Indeed, by role-playing and discussing the same story dilemma student learning may be reinforced, if similar ideas are expressed, and expanded, if new ideas occur during the discussions which were not expressed during the role-plays.

After each role-play, participants read their role profiles to the class and discuss the feelings they had while role-playing (in particular, "public officials" and "executives" discuss their emotional reactions to different approaches on the part of "residents") and which approaches made them most likely to be firm and which inclined them to make concessions. Nonparticipants discuss what they would have said and done had they been involved.

Encourage the students to develop role-plays of their own based, if possible, on their personal travel and work experiences either as consumers seeking redress of grievances from companies or government agencies or as employees of companies or government agencies responding to consumers seeking redress.

After the students complete the role-plays, list on the blackboard the possible approaches residents can use in seeking to influence industry and government, possible responses officials and executives can use to justify their positions, and constraints that may make it difficult for residents to succeed in their efforts.

Evaluation Method:

Students identify which forms of citizen action used in their role-plays were effective and would be likely to be effective in real life and why.

Sample Role Profiles*

Airport

Resident

You are Everett Smith, a teacher in the Quiet Cove Junior High School and president of the Parent-Teacher Association. You have two children in the neighborhood elementary school. As a parent, resident and teacher, you are angry about the proposed expansion of the small community airport in your town to serve regional transportation needs and accomodate scheduled air carrier flights. Even now, you must stop teaching whenever a small commuter jet takes off because your students cannot hear you. When the new runway is added, it will bring the planes even nearer the school and even closer to your house. So you circulated a petition among the students and teachers in the neighborhood and obtained 500 signatures. In your petition you demand that the airport add a runway in a different direction. You have just walked into the office of the airport general manager, John Doe, with your petition. What do you say?

Official

You, John Doe, are the general manager of Quiet Cove Municipal Airport. Your airport is small and now serves only private aircraft and a few air taxis. The region has started to grow and several large industries would move into the area if they had better air service. The local Chamber of Commerce and regional development commission are pushing for another runway. With the technical assistance of the Federal Aviation Administration (FAA), you have decided to add a runway in the direction of the town of Quiet Cove so you will have airport service during most of the good and bad weather conditions. You know that this will make more noise for the Quiet Cove community as planes take off and land over their neighborhood; there is a lot of pressure on you from the airlines, the business community, and the local government officials to expand. You could expand in another direction, but to do so would involve filling in the Cove, and this would be too expensive and could create problems with the natural environment. The FAA-recommended solution is cheaper and probably the best compromise. You have just ushered into your office Mr. Everett Smith, who made an appointment with you a week ago to talk over the airport expansion problem. How will you respond to him?

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*Several of these role-plays use the story lines from the scenarios provided on Spirit Master #3 for use with Activities 6, 27 and 29. For this activity the scenarios have been expanded and cast into parts for two persons. In view of this repetition of plot, you may want to use only some of the role-plays at the end of this activity. However, using the role-plays for this activity *and* using the scenarios on Spirit Master #3 for the other activities will not detract from your teaching efforts because of the different instructional approaches these different activities use. Indeed, by role-playing and discussing the same story dilemma student learning may be reinforced, if similar ideas are expressed, and expanded, if new ideas occur during the discussions which were not expressed during the role-plays.

Freeway

Resident

You, Frieda Cohen, live in a pleasant part of San Fernando, a large city with its share of traffic and parking problems. You have to fight every day, in fact, to get from home to work, a mile away, and then you have a problem finding a parking place when you get home. For some time now, you have been reading about plans for the construction of a freeway, I-999, a mile from where you live, to help people who want to drive into and out of the city from the suburbs. The proposed location would skirt the edge of a beautiful old park near your house. You feel that the freeway will bring more cars into the city, creating more parking problems and more air pollution. Proponents of the highway say that it will decrease travel time, increase safety by separating local and through traffic, and decrease air pollution on local streets. Finally, you got together with a group of residents and organized a citizen group called Stop I-999! You have invited the district engineer of the state highway department, Mr. Bob Wilson, to your neighborhood association meeting. You will have to make a presentation to him of your group's attitudes about this highway. Everyone at the meeting is quiet and comfortable and it is time to begin. What do you say?

Official

You, Bob Wilson, are the district engineer of the state highway department and have been involved for years in planning a freeway for San Fernando, a large city with more than its share of traffic and parking problems. As you see it, one way to solve some of these problems is to complete the freeway, already under construction, linking the suburbs with the city. After all, the city needs the money contributed by suburbanites in sales taxes and purchases to stay alive, and these suburbanites are tending to go to local shopping centers rather than travel by slow routes into the city. You know that some residents in San Fernando are unhappy with the highway--mainly because it is going to skirt one of the city's nicest parks--but you feel that in the long run the highway will help the city. Another reason you want this project is that you plan to run for state office next fall and you'll be able to point to it and perhaps get the suburbanites' votes throughout the state. A Ms. Frieda Cohen has organized a neighborhood group to oppose the highway. She has invited you to their meeting, and you're about to be put on the spot. How will you respond to her presentation?

Environmental Changes

Resident

You, Pat O'Reilly, live in Littleville, a small town about 40 miles from "the big city," North Neon. You like your quiet countryside, free of air pollution and noise and hordes of people. However, you have learned from the newspaper that the state highway department, with Federal assistance, plans to build a part of Interstate 44 just one mile outside Littleville. In order to locate the highway there, a bridge will have to be constructed over the best trout fishing stream in the county. The surrounding woodlands will be bisected by the highway, altering animal feeding paths. Most important, the exit at Littleville threatens to change the character of the town from a quiet rural village to a burgeoning suburb. The newspaper said the highway was being built there because it was the least expensive route--mountains, lakes and highly valued real estate in the city get in the way of other routes. But you're not interested in saving Uncle Sam money; you want your peaceful countryside left undisturbed. You got together with some townsfolk and decided you would represent the town and complain to the regional Federal highway administration in North Neon. You have just walked into the office of the chief engineer, Mr. Robert Chavez. What do you say?

Official

You, Robert Chavez, are the chief engineer of the regional Federal highway administration in North Neon, the capitol of the state. The state and Federal governments have gotten together to build an extension to Interstate 44 about 40 miles from the city that would save drivers from one to four hours depending on where they were traveling from and to. The best route for the highway is one mile outside of Littleville, about 40 miles south of North Neon. Any other route would be very expensive, if not impossible, because of the mountains, lakes, and the need to avoid North Neon traffic. However, a representative of Littleville, Pat O'Reilly, has made an appointment to see you about the highway. You have just ushered him into your office. What if he objects to where you plan to build the highway?

Noise and Safety

Resident

You, Hilda Jones, live on Pleasant Street, a two-lane suburban street lined with trees and houses. There are quite a few children and dogs in the neighborhood who are in the habit of playing outdoors and running from one yard to another. Unfortunately, Pleasant Street is an easy connection between two main highways and has just been designated a truck route by the town engineer. Now huge trailer trucks drive down the street from dinner time until morning. The noise is disturbing and you and your children are having difficulty sleeping. There's more dirt in the house and the vibrations from the trucks shake the pictures askew. When summer comes, it will be dangerous for the children to play outdoors after dinner. When you called the office of the largest regional trucking firm to complain, you were told that the truckers need to use Pleasant Street because it saves time--and that saves everyone money on the goods the truckers are carrying. You are not satisfied with the results, so you have made an appointment with the mayor, Louise Spontini. You have just been ushered into her office and taken a seat. What do you say?

Official

You, Louis Spontini, have recently been elected mayor of Suburbanville. You campaigned on a platform of progress, economic development, and jobs. One of the major contributors to your campaign was the truckers' union. At their urging, you have designated a truck route along Pleasant Street to connect two major highways. This will save the truckers time and prevent them from adding to downtown traffic congestion. There have been several complaints from residents of Pleasant Street about the noise, dirt, vibration, and safety--so many that you agreed to meet with their spokesperson, Ms. Hilda Jones. She has just been shown into your office. What are you going to say to her?

Urban Renewal

Reisdent

You, John Le Clair, live in a poor section of town near the docks where the ships carrying produce from distant ports come to leave their cargo and pick up goods to take to other ports. The city council has been talking about renovating the harbor area in order both to modernize it for the shipping industry and to develop it into a tourist attraction to bring added income into the city. The council is being urged by business interests to invest the money because, it claims, not only will the modernization benefit business, it will also provide construction jobs for the unemployed in the city. In addition, the new harbor area will contribute to the city's economic well being through taxes on the increased business activity from shipping and tourism that will result. Many city residents, too, would like to rid the community of a high-crime neighborhood which, they feel, is an eyesore with its bums and run-down hotels.

You live on the outskirts of the harbour and, as president of the harbor tenants association, have long felt that the area is full of local color and vitality. Moreover, you are concerned that the modernization will not only involve the demolition of the buildings in which many poor and minority people live, but very little if anything will be done to provide these dislocated people with substitute housing. Even if such housing is found, it will be scattered throughout the city ruining the ethnic communities that have found some sense of neighborhood near the harbor.

You have decided to take your case to the city port authority to see if you can't either prevent the modernization from taking place or, barring that, secure a guarantee of adequate relocation benefits for your fellow harbor residents. If you can't persuade the authority to accomodate you on either of these points, you are undecided about what course of action to take next, but you've been giving other alternatives serious thought lately, including going to the newspapers. You have just been ushered in to see the port authority chief of public relations, Beverly Schmidt. You shake hands and sit down. What do you say?

Official

You, Beverly Schmidt, are the chief public relations officer of the city port authority. The authority is responsible for running the city's harbor. Recently, the authority has decided in conjunction with the city council to modernize the harbor by installing up-to-date equipment to speed the loading and unloading of ships, to expand the port to accomodate the increased shipping that has occurred in the past twenty years, and to renovate the harbor neighborhood in order to remove an eyesore from the city and replace it with tourist attractions and a high-rise apartment complex. The authority feels that this renovation will help revitalize the inner city, slow down the exodus of the middle class into the suburbs, and provide a greater tax base for the city as a result of the increased tourism, new luxury apartments, and expanded shipping business.

However, some community residents and politicians have opposed the plan on the grounds that it will require dislocating a major ethnic group that has, they claim, a thriving community next to the harbor. There is also a concern that it may disperse the harbor bums into other parts of the city where they will be just as visible and undesirable as they have been felt to be around the harbor. Although you plan to try to follow the Federal government's laws regarding compensation for displaced persons, you know that you will have a hard time convincing some people of your sincerity and that you may not be able to provide the harbor residents with adequate substitute housing and a cohesive neighborhood. In any case, there seems to be little you can do for the bums who will be forced to leave.

John Le Clair, president of the harbor tenants association, has made an appointment to see you about the harbor renovation plan, and you're afraid he might try to cause trouble if you can't meet some of his concerns. Although the port authority has a great deal of independence and has its own sources of income, if the harbor plan becomes too much of a political football and the press begins to oppose it too strenuously, the authority might have to abandon or modify its plans. So you usher Mr. Le Clair into your office, give him a warm handshake, and ask what you can do for him.

Park

Resident

You, Rachel Svenson, travel to and from work every day along several side streets, bucking exhaust fumes and other short-tempered drivers and wasting over an hour-and-a-half of your leisure time. You have realized for a long time that if the city would only build a highway through Paradise Park you and many of your fellow automobile drivers could reduce your commuting time in half and your daily frustration level by three quarters. But other residents of the city have always been able to prevent such a road from being built by claiming that it would destroy the peace and beauty of Paradise Park.

Recently, the mayor appointed a new person to be head of the city highway department. He, unlike his predecessors, has been sympathetic toward the idea of building a road through the park but has been strongly opposed by the city environmental protection administration (CEPA). You have decided, as a member of you local Citizens for the City Society, to have a talk with the head of CEPA in an effort to convince him of the need for the highway and, if necessary, of the voting power behind you to remove him from office.

You have engaged the services of a highway expert who has told you that not only will the highway speed up the flow of traffic, it will also reduce pollution by cutting down on the city's rush-hour stop-and-go traffic. By building attractive bridges and underpasses, park lovers would not be inconvenienced. You plan to refer the successful examples of highways running through Golden Gate Park in San Francisco and Central Park in New York City. You have just been ushered into the office of Darrol Washington, chief of the city environment protection administration. You shake hands and begin to present your case. What do you say?

Official

You, Darrol Washington, came to the United States from France many years ago. You had always been impressed with the way the Paris officials have refused to allow high-rise buildings or major highways to be built in the city (although that has now changed, much to your regret). You immigrated to Carthage City, where you became chief of the city environment protection administration (CEPA).

Off and on for the past six years you have successfully fought off attempts by the public and certain business interests to relieve traffic congestion around Paradise Park by building a highway through the park. You have always felt that roads, cars, buses, and so on have already damaged enough of the landscape, even though you realize they have also been of tremendous benefit to society. But park lands have always been especially sacred to you and the idea of putting a road through Paradise Park truly upsets you.

Recently, however, the city administration changed, and a new head of the city highway department has been appointed who is mounting a campaign to put in a road through the park. He argues that such a facilitiy would actually reduce pollution by eliminating much of the stop-and-go traffic along other city streets. But you've seen how the fumes from cars in Central Park in New York City have jeopardized the health of the zoo animals in the park and how automobile traffic in San Francisco's Golden Gate Park has interfered with bicycle traffic. So you're not convinced. But you realize that you may not be able to hold off much longer. So if you must give in, you want to make sure the road is built in such a way that as much of Paradise Park's quiet, peace, natural beauty, and pedestrian and bicycle opportunities are left undisturbed.

Right now you have an appointment with a Ms. Rachel Svenson who represents a local citizen group which advocates the construction of the highway. You usher her in and ask her what you can do for her.

ACTIVITY #29

Mini-unit Topic: Investigating Citizen Participation

Approximate Class Time: 1 period

Capsule Activity Description: Students discuss when to engage in citizen participation to oppose a harmful effect of transportation on the environment.

Goal:
To be able to decide when citizens should engage in citizen participation to oppose a harmful transportation effect on the environment.

Concepts Treated:

- There are many times when it is appropriate for the public to engage in citizen participation to oppose a harmful effect of transportation on the environment or a feature of the environment that hinders travel safety, convenience, or enjoyment.
- Citizens need to be able to identify when citizen participation is justified to oppose a transportation vehicle or facility that is having or will have harmful effects on the environment.
- Citizens need to develop the ability to resolve conflicts between transportation and the environment.

ACTIVITY

Give students one of the scenarios provided on Spirit Master #3* or a scenario you or the students themselves develop for the activity.

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*All but one of these scenarios uses the story line from the role-plays provided at the end of Activity 28. In view of this repetition, you may want to use only some of the scenarios. However, using the scenarios with this activity *and* using the role-plays with Activity 28 will not detract from your teaching efforts because of the different instructional approaches these different activities use. Indeed, by discussing and role-playing the same story dilemma, student learning may be reinforced if similar ideas are expressed and expanded, or if new ideas occur during the role-plays which were not expressed during the discussions.

Have students write whether they feel the citizen affected in the scenario by the harmful transportation effect or feature of the environment has the right to engage in citizen participation to oppose or alter it and why.

During the following class period, break the students into small groups and give them written instructions to read the papers of the other members of their groups and try to reach a consensus on:

1. Is the citizen described in the scenario justified in taking action against the harmful transportation effect or feature of the environment?

2. Why should or should not the citizen take action?

3. What would the nature of the transportation effect or feature of the environment have to be--how serious, how many people affected, etc.--before citizen participation would be justified?

Then have the groups describe their conclusions to the class, allowing other groups to comment on the presenting group's ideas. Finally, conduct a class discussion around whether or when the following considerations would warrant citizen participation against the use of a vehicle or transportation facility that is having harmful effects on the environment or against a feature of the environment that interferes with travel safety, comfort, or enjoyment:

- How many people must be affected vs. how many are benefited?
- How much are the people harmed vs. how much are other people benefited?
- Did the affected people move into the area after the problem existed?
- Are there personal, inexpensive preventive measures citizens can take to reduce or eliminate the problem?
- Are there important transportation needs the mode of travel or facility meets that outweigh its harmful effects?
- Are there constraints--time, financial, technological--that make it difficult or impossible to solve the problem?

Evaluation Method:

Students decide whether citizens should engage in citizen participation in one of the scenarios provided on Spirit Master #3 that was not used during the activity. Students justify their decision to the rest of the class.

ACTIVITY #30

Mini-unit Topic: Investigating Citizen Participation

Approximate Class Time: 2-6 periods, plus out-of-class time

Capsule Activity Description: Students engage in citizen participation to reduce transportation's harmful effects on the environment or to alter hindrances to travel caused by features of the environment.

Goal:

To know how to engage effectively in citizen participation.

Concepts Treated:

- Citizens need to be able to identify when citizen participation is justified to oppose a transportation vehicle or facility that is or will have harmful effects on the environment or a feature of the environment that has or will have adverse effects on travel.
- Citizens need to develop the ability to resolve conflicts between transportation and the environment through citizen participation.

ACTIVITY

In small groups students develop and execute a course of action designed to reduce transportation's harmful effects on the environment or an obstacle to travel safety, convenience, or enjoyment created by a feature of the environment. Examples of appropriate citizen participation to resolve conflicts between transportation and the environment are provided at the end of the activity. Students should be encouraged to think of other activities they can engage in that involve resolving conflicts between transportation and the environment they have actually experienced or are currently experiencing.

Instruct each group to engage in the following steps:

1. Select a harmful effect that it would like to reduce or eliminate and decide whether political or social action on its part can achieve such a reduction and whether it would be appropriate for it to take action.

2. Decide exactly what its objective is--what it expects to achieve, defined in measurable terms (e.g., 20 percent fewer commuters driving their cars to work) and what constraints may make it difficult to achieve its objective.

3. Develop a detailed plan for achieving its objective, in sequential steps, and determine who is going to engage in which tasks.

4. Before engaging in action, consider the justifiability of its methods (are they ethical? why?). Have the plan reviewed for effectiveness and justifiability by you, the appropriate community officials, or experts, such as the district attorney's office, conservation club, or consumer protection agency or organization.

Groups then engage in their citizen participation endeavor, each member keeping a log of his or her actions and their effects.

After engaging in its political or social action, each group evaluates the extent to which it achieved its objectives; discusses why the action succeeded or failed; if it failed, discusses what might have been done differently to make it succeed; prepares article for submission to school or community newspaper on its activity; and prepares and presents a report to the class.

Evaluation Method:

Students write a booklet, for use in the town library, that describes the steps necessary to engage in citizen participation to resolve conflicts between transportation and the environment.

Examples of Citizen Participation

Students analyze a current, planned, or proposed highway or road construction project in terms of competing travel needs and environmental considerations and then present recommendations to the appropriate authorities.* Suggested questions students can analyze as they participate in this activity include the following:

1. What are the benefits the proposed highway will have?
   - (a) Who will benefit: suburban commuters? inner-city poor? rural farmers? construction workers (through employment building the facility)? truckers? motel companies or other commercial enterprises?
   - (b) How will these individuals and groups benefit: less time expended commuting to work? improved garbage collection? better emergency service? improved access to other forms of transportation? speedier bus service? greater profits for businesses?
   - (c) Will the highway have benefits for the environment: reduction of stop-and-go traffic? diversion of traffic from elsewhere and reduced traffic congestion? better access to parks and historical sites? provision of scenic views and development of attractive architecture (bridges, landscaping)?
2. What effects will the highway's *route* have?
   - (a) How will it affect transportation safety, convenience, and enjoyment? Will it, for example, promote convenience by enabling drivers and buses to travel in less time than previously? Will it provide enjoyable travel by providing scenic views?
   - (b) How will it affect the environment? What *beneficial* effects will it have on the environment? [See examples in 1(c) above.] What *harmful* effects will it have, such as damage to wildlife, parks, historical sites? pedestrian problems? displacement of homeowners, renters, or businesses? obstruction of scenic views? creation of noise problems for pedestrians, dwellers, schools? construction of potentially undesirable service facilities (e.g., gas stations, restaurants)? increased congestion in other parts of the community?
3. How could the route be *altered* so that the highway's or road's transportation benefits and benefits to the environment could both be enhanced and its harm to the environment reduced or eliminated?

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*Students can analyze a planned new or expanded airport or rapid transit project instead of or in addition to a highway project.

4. How could the highway's or road's *features* be developed so these goals could be best achieved? For example, should parts or all of it be elevated or below street level? How wide should it be? Should it be a restricted access highway?

5. Should there be any restrictions on *use* of the highway or road that would help balance the needs of transportation and the environment? For example, should the road exclude trucks? have a minimum speed limit? provide special bus lanes?

Students engage in volunteer work for organizations devoted to reducing transportation's harmful effects on the environment. Questions students can seek to answer during their "stint" as a volunteer include the following:

1. What specific harmful effects of transportation on the environment does this organization seek to reduce? Or, what specific beneficial effects does it seek to preserve?

2. Will the reduction of these harmful effects involve sacrificing any of transportation's benefits to society? If so, is the sacrifice worth it? Why?

3. What are the methods by which the organization seeks to reduce harmful effects or further its goals? Are these methods working? Why or why not? What constraints make it difficult for the organization to achieve its goals?

4. Are there other methods that would be more effective? If so, why aren't they used by this organization?

5. Are there ways other private citizens could be encouraged to engage in similar volunteer work, if such work would be helpful?

Volunteers keep a log of their impressions and experiences. Either during or after the experience, volunteers present reports to the class on their work and share with the class the answers to the above or similar questions.

Sample organizations and agencies that may either welcome volunteer work or be able to identify other organizations that do are listed below. Consult the telephone directory for local offices or branches or write to their national headquarters.

National Audubon Society
950 Third Avenue
New York, New York 10022

The Sierra Club
1050 Mills Tower Building
San Francisco, California

Roadside Councils in Phoenix,
Arizona; San Francisco, California;
Denver, Colorado; Maplewood, New Jersey;
Cleveland, Ohio; Portland, Oregon;
Honolulu, Hawaii; Seattle, Washington;
Milwaukee, Wisconsin; Springfield, Vermont;
and Media, Pennsylvania

Bureau of Outdoor Recreation
Department of the Interior
Washington, D.C. 20240

The Conservation Foundation
1250 Connecticut Avenue, N.W.
Suite 700
Washington, D.C. 20036

Keep America Beautiful
99 Park Avenue
New York, New York 10016

General Federation of Women's Clubs
1734 N Street, N.W.
Washington, D.C. 20036

Men's Garden Clubs of America
626 High Street, N.E.
Salem, Oregon 97301

National Council of State Garden Clubs
309 Rockwell Terrance
Frederick, Maryland 21701

Students can form a committee to act as ombudsman for complaints about transportation's harmful effects on the environment and obstacles to travel created by features of the environment. For each complaint it hears, the committee can

1. Question the "plaintiff" to obtain all relevant information, such as dates, exact nature of the effect, why it is perceived as being harmful, and willingness of plaintiff to see the problem through to a resolution

2. Inform the plaintiff that the committee does not guarantee any results, nor does it necessarily agree with the plaintiff's position

3. Decide whether it will handle the case based on transportation's (or the environment's) beneficial effects as well as harm to society

4. Decide how it will handle the case, such as determining what further information it may need before talking with the alleged offending party; how it expects to overcome constraints to solving the problem; how it should approach the alleged offender; and whether the committee should act as a group, with or without the consumer, or designate one of their number to take the agreed-upon action

Students develop and implement an educational campaign in their community regarding conflicts between transportation and the environment. Before developing their plan, students will want to determine the following:

1. What specific *issue* will they deal with?

2. What *target groups* in the community will they "educate" (unless the class decides to gear its campaign to the entire community), e.g., public officials? employees of a business? junior high school students? lawyers? housewives? Rotary? Chamber of Commerce? students' own parents? teachers? residents of a particular part of town or a street? The class selects a target audience that is in need of being educated--one that is not already well informed, is not already taking appropriate actions, and is in a position to take meaningful action if supplied with relevant information and motivation.

3. What *media or channels of education* are available to the class in its community for educating the public? radio? television? distribution of fact sheets? library handouts? public lectures? speeches and discussion with community groups and leaders? school assemblies? The class identifies these potential media so that any plan it develops can be implemented. Identifying them may require interviews and phone calls to responsible media authorities to learn whether students will be able to implement their campaign through these media.

4. What *objectives* does it want to achieve? What, precisely, does it hope to accomplish? If interested, and time is available, the class can conduct pretests of target audiences in the community and compare findings with a posttest at the end of the campaign. An example of a realistic objective might be to have the target group demonstrate, in an interview, awareness that transportation has serious effects on air pollution and the ability to identify at least two actions it can take to reduce those effects.

5. What *information and attitudes* should be conveyed to the target audience to achieve the objective(s)? information on the relationship between cars and air pollution? methods for reducing automobile use compatible with the positive benefits cars provide?

6. What *educational strategy* should be used to present the information and achieve the objectives?

7. Which *channel or media* should be used to convey the information? lectures? handouts? television?

Students participate in a hearing on transportation's effects on the environment. Students can consult the reading that follows, as well as the section "Readings on Transportation and the Environment" of this chapter, for information on mechanisms for public participation. To learn when local hearings on environment issues are taking place students can consult announcements in local newspapers; local agencies responsible for environmental affairs, consumer affairs, or transportation planning; state highway agencies; regional offices of the U.S. Environmental Protection Agency; and local citizens groups involved with environmental or conservation issues.

Public Hearings*

Another way to communicate with the public is to testify at public hearings. Your objectives should be two-fold: (1) to get your views before the control agency or legislative body holding the hearings and (2) to air your views through the press and broadcast media.

The following suggestions are based on the experiences of many citizen organizations that have been through the earlier stages of the fight for clean air. Your group may be one of them, but you may, nevertheless, find these suggestions helpful.

Before the Hearing

1. Prepare a typewritten statement and make copies.

2. Prepare a press release and deliver it at least the day before the hearing, with a copy of your statement. Be sure both the release and the statement are marked "Advance Copy--Not For Release Until..." (Insert date and time when you expect to present the statement.)

3. If possible, deliver the release and statement to your press contacts personally. If you can't do so, call and tell them the release and statement are on the way. Don't waste reporters' time discussing or reading the release or statement on the phone unless they ask you to.

This advance press work does several things: it reminds the press that the hearing is coming up; it shows your press contacts that you've

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*From *Clean Air. It's Up to You, Too* (Office of Public Affairs, U.S. Environmental Protection Agency: Waterside Mall, Washington, D.C. 20460). It should be noted that citizens need to be alert--by reading newspapers and listening to the radio--to notices that a hearing is going to be held.

thought of them, even though they know you want coverage; and, if they cannot cover the hearings, at least they have your statement.

At the Hearing

1. Have a prepared typewritten statement, with enough copies for each member of the committee or board or commission conducting the hearing, plus extras for their files, and have more copies for the press along with your press release.

2. Be brief. Speak no more than four or five minutes, but ask to have your full statement included in the hearing record.

3. Begin with your name, address, title or group affiliation, and cite other groups, if any, that support your position and have asked you to say so.

4. Tell why you support, or oppose, the subject under consideration. Give facts to support your position. Don't make accusations you cannot support.

5. If appropriate, explain how the public interest is affected, who will benefit and how much it will cost.

6. If your group has several spokesmen, make sure to avoid repetition unless emphasis is desired. Have each speaker cover a different point, or approach the problem from a different aspect.

7. Speak clearly--loudly enough to be heard, slowly enough to be understood, but quickly enough to keep the listeners' attention.

8. Be prepared to answer questions--to explain your position, to explain the purpose of your group, to explain how your group's position was reached (executive board vote, membership meeting vote, mail referendum, etc.). If you don't know the answer to a question, say so, and offer to try to get the answer and send it in for the record. On rare occasions, a committee or board member may be hostile and attempt to rattle, confuse, irritate, or intimidate you. Don't let yourself get confused, angry, or nasty. Keep your cool.

9. Try to have as many supporters as possible attend the hearing. Casually mention their presence in your opening comments. Some call this "packing a hearing." Others call it "showing strength and support." Numbers reinforce your stand. An indication of support can sway legislators as well as public opinion.

10. Listen carefully to other statements presented, especially by the opposition. Make note of factual errors or new ideas or proposals, for you may be asked to comment on what other witnesses say. If so, don't attack the opposition or make personal remarks.

11. Respect the right of others to disagree with you. Do not applaud or show disapproval of any speaker.

12. If you have written statements of community leaders, other organizations, etc., who support your position but could not attend the hearing, ask that the statements be included in the hearing record.

13. Thank the committee for giving you the opportunity to testify.

After the Hearing

1. Promptly prepare and submit answers to any questions you were asked but could not answer at the hearing. If you think any statements made by the opposition were factually incorrect or need rebuttal, prepare and submit a supplementary statement for the record. But don't rehash what you said in your original statement.

2. If your press contacts wrote or broadcast stories containing your views, phone them and thank them for the coverage.

3. Don't complain to the press if your views weren't included in their coverage or if you think the coverage was bad or that you were misquoted.

4. A few days after the hearing, send a letter to the newspaper editor for publication referring to the hearing and pointing out what, if anything, the public can do to help.

5. Let your own members know what happened at the hearing through your organization's newsletter or by a special letter to all members and include copies of press clippings, if any.

READINGS ON TRANSPORTATION AND THE ENVIRONMENT

ENVIRONMENTAL AND HEALTH EFFECTS OF AIR POLLUTION*

The effects of air pollution vary with time and place and person, but few of us can escape these effects altogether. Air pollution can impair health. Dirty air makes eyes water and smart; it stings the throat and upsets breathing. People with chronic lung or heart disease are particularly vulnerable to air pollution. Epidemiological studies indicate that direct relationships exist between prolonged exposure to polluted air and the incidence of emphysema, bronchitis, asthma and lung cancer. Polluted air, sustained and heavy for several days, has caused serious illness and death--especially among infants, the elderly, and people with weakened hearts or lungs.

More obviously, air pollution reduces visibility. It can spoil scenic vistas. It can ground planes and make driving hazardous. Its corrosive qualities cause vast economic losses and contribute to the deterioration of cities. It rots and soils clothes, discolors house paints, and rusts metals. It marks monuments and public buildings and increases housekeeping chores and costs for families and businesses.

Damage from air pollution affects rural areas too. It injures vegetation, stunts the growth of shrubs and flowers, damages crops and trees and causes illness among livestock. To farmers, these costs are direct; to most of us, they come indirectly in the form of higher food bills.

Air pollution threatens the delicate, complex natural systems on which all life depends. Undesirable ecological changes may well be its most dangerous long-range result. Signs of climatic alternations are already appearing, at least on a small scale. In 1969 we poured 281 million tons of pollutants into the air in the United States alone, ignoring the dangers that we might be degrading our environment beyond repair.

Automobile Emissions and Their Control

The automobile is one of the nation's major environmental polluters. By weight, more than half of all of the nation's man-made air pollution can be attributed to the internal combustion engine. In some urban areas, it reaches 85 percent of the total quantity of air pollution. Its exhausts include carbon monoxide, hydrocarbons and nitrogen oxides. The automobile also emits varying amounts of lead abestos and other pollutants, many of which end up in the lungs.

Efforts to reduce the level of auto emissions in this country are proceeding along three fronts. Individuals are being encouraged by public interest organizations to increase their use of less polluting modes of travel--car pools, bicycles, walking, and public transportation--and to maintain their automobiles in optimum emission-reducing condition. At the same time, Congress recognized, in passing the 1970 Clean Air Amendments, that the real problem rests with the internal combustion engine itself. Finally, the various states having major air pollution problems have undertaken a program of controlling emissions from already existing vehicles.

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*This reading has been adapted from *A Citizen's Guide to Clean Air*, the Conservation Foundation, 1717 Massachusetts Ave., N.W., Washington, D.C. 20036 under contract with the U.S. Environmental Protection Agency, Catalog No. 71-187901, January 1972.

The 1970 Clean Air Amendments

This law requires that the Federal Environmental Protection Agency (EPA) set standards for emission of carbon monoxide, hydrocarbons and nitrogen oxides. On June 30, 1971, EPA announced a staged schedule for emission reduction which would ultimately result in the following maximum levels of the three major pollutants:

3.4 grams of carbon monoxide per vehicle mile	(1975)
.41 grams of hydrocarbons per vehicle mile	(1975)
.40 grams of nitrogen oxides per vehicle mile	(1976)

The burden of achieving these standards rests with the automobile manufacturers who may request extensions in the timetable but must ultimately comply with this legislation.

Assuming that the automobile manufacturers do eventually meet standards, how reliable will the emission control devices be? The earlier devices have not proved to be entirely satisfactory. The *Washington Post* reported on August 29, 1971, that

> a seven-city survey of 1,000 privately driven 1970 models, averaging 9,000 miles use, found them exceeding their carbon monoxide ceilings by 100% and their hydrocarbons by 50%. EPA scientists do not know why these 1970s showed such poor results, but theorize that ignition and stalling problems prompted owners to take their cars in for adjustments that distorted the performance of emission controls, which rely on a retarded spark and a clean fuel-air mixture.

The 1970 Clean Air Amendments authorize the agency to test assembly-line models and require the manufacturers to do so also. The Act prohibits manufacturers or dealers from selling noncomplying vehicles and from removing or making inoperable any control device. Penalties for violation of this section are as high as $10,000 for each offense. EPA is required to publish the results of emission tests performed on prototype and assembly-line models of all makes of new cars. Citizens can consult the regional EPA offices to find out when the results are published in the *Federal Register*.

Beginning with 1971 model cars, manufacturers have been required to include in their new car warranties a guarantee that the car complies with applicable emission regulations and that it is free from any defects that would prevent it from complying during its useful life (five years or 50,000 miles). When better tests have been developed to check the performance of the emission control devices, the manufacturers must provide new warranties which require that they replace at their own expense any faulty control device if, during the car's useful life

1. The faulty device was maintained and operated in accordance with the manufacturer's instructions;

2. Failure of the device results in the owner being penalized, including the loss or right to operate the car, fines, and so on.

The law also provides a Federal program for the purchase of special low-emission vehicles for government use, once they are developed. Citizens may decide to urge their state and municipal governments to adopt similar purchase requirements. Once the Federal certification and purchasing program has stimulated the development of such vehicles, state purchases can help expand the market. The city of Boston has already announced its plan to convert all city-owned cars to run on liquified natural gas. Since the costs of fuel and maintenance for this fuel are lower than those for ordinary cars, Boston hopes to recover much of its initial changeover investment while reducing air pollution in the city.

State Responsibilities for Auto Emission Control

Although the 1970 Clean Air Amendments specifically prohibit states (except California) from setting their own emission standards for *new* vehicles they do retain the responsibility of controlling emissions for *existing* vehicles. This poses a number of problems, such as establishing vehicle inspection and enforcement programs, developing other control strategies and ensuring the availability of alternative modes of transportation.

Auto emission standards are only as good as their enforcement, and enforcement may be almost impossible without a practical, reliable inspection system. Many states are contemplating adding an emission inspection to their automobile safety inspection, but several factors should be considered before such a decision is advocated by citizen groups. One of these is the lack of simple and reliable testing equipment and procedures which produce replicable results. Several practical and reportedly accurate testing systems are under development, but they may prove expensive. Expense itself is another factor. Will the benefits of an inspection program outweigh the cost of establishing and maintaining it? The initial investment for a statewide system can easily run into millions of dollars, and the results of a few experimental programs have been disappointing. It is often difficult to get proper repairs for cars that have failed the test. Once the control device is adjusted, it may only remain that way for a couple of months. Emission control devices do curtail vehicle performance, especially in acceleration and idling. Thus, a third problem is the tendency of many motorists to adjust their cars properly only to pass the test, and then readjust them to operate more satisfactorily.

Another problem to be considered is the operational difficulties of administering a state-wide inspection program in states having varying amounts of air pollution, depending on the distribution of population, the distances between urban centers and meteorological conditions. Sparsely populated states may find the costs of operating such a system prohibitive. Finally, the heaviest burden of a vehicle inspection system may well fall on low-income car owners who often drive the older and less-cared-for problem cars and generally have poor access to public transportation to much needed jobs, schools and shopping.

There are alternatives to vehicle inspection systems which show promise for effective reduction of air pollution. These methods focus on reducing the total number of miles driven by all cars in a heavily polluted area, instead of on the emissions of an individual vehicle. These control strategies include reduction of highway construction, restriction on driving in certain downtown areas, incentives to car poolers, taxes on mileage or on gasoline, express busways along existing freeways, and the development and support of high quality public transportation in urban areas. They are generally part of a state's "implementation plan"--that plan required under the 1970 Clean Air Amendments for the "implementation, maintenance and enforcement" of any air quality standard set forth by EPA.

Before advocating either an emission inspection program or alternative control strategies, citizens may want to do further research on the advantages and problems of each. One place to start is with two studies done for EPA by the Institute of Public Administration. These are Governmental Approaches to Air Pollution Control and Governmental Approaches to Automobile Air Pollution Control. Both studies present interesting discussions of the economic and administrative dimensions of different control strategies.

The Citizen's Role

In addition to curtailing the pollution from their own vehicles, citizens have several other responsibilities with respect to controlling automobile pollution. The first of these is being informed. The 1970 Clean Air Amendments recognize the right of citizens to know what the air quality situation is in their respective regions. States are thus required to gather emission data from individual sources, correlate them with the standards, and make this information available to the public. Citizens in some states may want to press their state agencies to make such reports available in local libraries or other accessible locations.

Even more important is attendance at and participation in public hearings. The Clean Air Amendments of 1970 declare that public hearings must be held in each state before it adopts an implementation plan and sends it to EPA for approval. Each state must

1. Provide at least 30 days' notice of a hearing through prominent advertisement of the hearing's date, time and place;

2. Make available for public inspection, in at least one location in each control region, the principal portions of the proposed implementation plan for that region;

3. Make available for inspection all rules and regulations proposed for inclusion in the plan; and

4. Keep hearing records that will contain, at a minimum, the list of those testifying, together with the text of each presentation.

Citizens may want to press state officials to hold a public hearing in their locale, even though technically only one is required in the state. Attendance of large numbers of people at hearings who support strong plans and testify to this effect, however briefly, will help counter the arguments of those who claim that environmental concern is a passing fancy. This testimony will help to build a good hearing record which is important in EPA's consideration of whether or not to approve the plan. Also, if there are any legal challenges to the plan, the court will base its decision, in part, on the hearing record.

Finally, the 1970 Amendments specifically recognize the right of citizens to bring suit against any violator of standards or other requirements of the Act. Any "person" may sue another "person" for failure to enforce or comply as required. "Person" is defined as "an individual, corporation, partnership, association, State, municipality, or political subdivision of a State." There are two limitations to this right: no one may sue EPA for an action not specifically required under the Act, and no one may sue his own state, except under certain circumstances. The Act authorizes any court to award any costs of litigation, including expert witness fees and reasonable attorney fees, to any party to a suit, as the court thinks appropriate. Although this provision removes one of the common deterrents to litigation by private citizens--expense--court action can still be very difficult and time consuming, and may not always be the most effective way to proceed. A good attorney should be consulted on the desirability of taking this kind of action.

Environmental Statements Required for Highway Projects

An FHWA Policy and Procedure Memorandum, PPM 90-1, gives guidelines for environmental statements that are now required by Federal legislation.

Section 102(2) (c) of the National Environmental Policy Act of 1969 requires statements on environmental impact to the Council on Environmental Quality. Section 4(f) of the Department of Transportation Act sets conditions on the use of certain public land. Section 470f of 16 U.S. Code requires consideration of effect on historic sites. Section 309 of the Clean Air Act of 1970 restricts Federal projects that have environmental impact on matters in the Act.

As the PPM states, it is a national policy that all Federal agencies promote efforts for improving the relationship between man and his environment and to make special efforts for preserving the natural beauty of the countryside and public park and recreational lands, wildlife and waterfowl refuges, and historial sites.

It is also national policy that Federal agencies consult with other appropriate Federal, state, and local agencies; assess in detail the potential environmental impact in order that adverse effects be avoided and environmental quality is restored or enhanced, to the fullest extent practicable; and utilize a systematic, interdisciplinary approach which will insure that integrated use of the natural and social sciences and the environmental design arts in planning and decision making which may have an impact on man's environment. The environmental assessments include the broad range of both beneficial and detrimental effects.

An environmental statement for a highway project must include the following information: (1) A description of the proposed highway improvement and its surroundings. (2) The probable impact of the proposed development or improvement. (3) Any probable adverse environmental effects which cannot be avoided should the proposal be implemented. (4) Alternative locations or designs with complete descriptions. (5) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity. (6) Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should be implemented. (7) Where unavoidable adverse environmental effects are encountered, planning measures taken and proposed to minimize harm to be identified, including those relating to Section 4(f) lands. (8) Final statements to incorporate all comments received on the draft (including environmental comments contained in the public hearing transcript) along with a discussion of the comments and suggestions.

A proposal to develop or improve a highway section should be coordinated in the early stages with appropriate local, state, and Federal agencies under regular FHWA procedures. Coordination at the beginning of the location study will assist in identifying natural and cultural areas of significance, agency and public concerns, and help in determining the need for and preparation of an environmental statement.

Draft environmental statements must be furnished to the Council on Environmental Quality (10 copies), the Department of Transportation's Office of Environment and Urban Systems (3), the FHWA Office of Environmental Policy (2), and the FHWA Regional Office (1). Thirty to 45 days must be allowed for comments. The statements must be available for review by the public and at the appropriate public hearings. They will also be made available for purchase from the National Technical Information Service.

The final environmental statement shall include a copy of all comments received and reflect the consideration and disposition of the environmental comments at the public hearing and the comments received on the draft statement. Negative declarations shall be prepared when the anticipated impact of construction and operation of a highway section is determined to be not of major importance.

Environmental statements must be prepared for all highway sections financed with Federal funds which received design approval after February 1, 1971. For such highway sections that received design approval between January 1, 1970, and February 1, 1971, statements must be prepared if the FHWA Division Engineer judges it to be necessary for full implementation of the National Environmental Policy Act.

In addition, the National Environmental Policy Act also applies to new airports and several other major projects that would significantly affect the environment. The Act is designed to encourage environmental considerations at the earliest levels of decision-making for all of these areas in an attempt to harmonize transportation planning and programs with the surrounding environment.

Process Guidelines for the Action Plan

The work of the highway official has shifted dramatically in recent years. In the early days, highway funds were largely spent on improvements to existing substandard roads. Today, highway projects often go where there never has been a road, and find it increasingly difficult to avoid encountering housing development, scenic view, or park. Not too long ago, measures to soften the environmental impact of highways were often seen by the public as extravagant frills. Now the public pressures for funds to be spent in this direction. The highway official, state and local, has long been aware of the potential impact of his work. To build a road, one must fell the tree, lower the hill, bridge the river. Highway experts have sought to soften these impacts--experimenting with planning techniques and improving construction methods.

In response to public demand, Congress has enacted a series of requirements and authorizations to help the highway administrator protect the environment:

- The 1950 Federal-aid Highway Act created public hearing requirements.
- In 1962, legislation called for greater participation by local officials, and coordination of urban transportation plans with an area's comprehensive plan.
- In 1966, Section 4(f) of the Department of Transportation Act called for special efforts to avoid taking land from parks, wildlife refuges, and historic sites.
- The landmark National Environmental Policy Act of 1969 required that a written evaluation of the environmental impacts of each significant project be circulated to other agencies and the public; that project development include a multi-disciplinary approach; and that alternate plans be developed.
- The Federal-aid Highway Act of 1970 contained Section 136(b), designed to make sure that each state would fully consider the impacts of any and all proposals for highways within that state.

Section 136(b) called on the Secretary of Transportation to assist states to reach this goal by issuing guidelines--general directions to the states for incorporating, in highway decisions, factors of economic, social and environmental significance.

Federal highway authorities felt that a *process* approach would be most practical to the guidelines. The *process* approach requires each state to detail the process or procedures that it will follow to make certain it will give proper consideration to the effects of its highway works. This detailing of a state's individual procedure is called its *action plan.* The *process* approach and its required plans recognize that the definition of environment can often best be made by a community itself and provide means of doing this through involvement of the public and other agencies.

Specifically, the guidelines spell out four fundamentals that an action plan must satisfy, each fundamental to be developed by a state and used in its highway programs. The guidelines only point the way.

The first fundamental is *identification.* A state highway department must build a competency in identifying and objectively studying the impacts of a highway project--economic, social, environmental. It must have the experts on its staff, or available as outside experts or consultants, who can make professional, in-depth studies. Although other agencies can assist in these studies, the state must have a competent, qualified source of expertise. Without this competence, a state highway agency would have difficulty convincing the public that its decisions are based on a knowledgeable balancing of transportation, economic, social, and environmental issues.

The second fundamental is the requirement that a state highway authority develop an *interdisciplinary* approach to highway projects... from early systems planning to final design...since not all the impacts and problems involved in a highway plan are exclusively of an engineering nature. The action plan must show how a state will have the expertise of other disciplines to assist the state's investigation into a project's various by-products, especially those of a non-transportation nature.

The third fundamental is *involvement*. Other agencies, and the public, must be involved in the planning, location, and design of a highway, in a manner each action plan spells out.

Only by such involvement can impacts be forced to surface that highway specialists--unassisted--might not recognize. Only by such involvement can public attitudes toward a specific project be determined as a vital ingredient in the making of decisions in the public interest. Only by such involvement can public confidence in a state highway agency's knowledge and fairness be maintained.

The fourth fundamental is *alternatives*. Every highway study must contain alternatives, or choices. This requirement guarantees that a highway agency will actually consider possible alternatives, and evaluate the pros and cons of each.

This requirement assures the public a chance to judge the options, rather than being presented with a single solution, and being asked to give it a yes or no. This requirement allows an agency and its public to compare the costs and benefits of taking a particular action versus a decision of no build.

Citizens may want to obtain a copy of their state action plan for review in light of these four process requirements. The specifics of the processes the states will outline in their action plan are of their choosing. Standardization of action plans is not required, or desired. The guidelines are general enough to allow each state to adopt procedures to suit its own unique situation. Thus, although each state must, for example, provide for public debate, how this is done is left to each state.

Hopefully, there will be originality and inventiveness in the way the various states elect to meet the obligations set down by the guidelines.

The development of these action plans will be a major undertaking for every state. It will, in many cases, entail significant changes in highway agency organization and procedures, the acquiring of new expertise, and the development of new areas of responsibility within highway agencies.

It offers the opportunity to bring about a solution to many of the problems that began that day long ago when the first horse trail was broadened that a car might pass.

Above all, the action plan may prove to be the answer to that dilemma of the highway administrator and engineer in our time--the need of the nation for roads, and the desire of the nation for an environment that is safe, quiet, and beautiful.

PUBLIC HEARINGS IN HIGHWAY PLANNING*

The federal Department of Transportation provides for a two hearing procedure to give all interested persons an opportunity to become fully acquainted with highway proposals that concern them and to express their views at a time in the process when the plans are still flexible. The first hearing, called a "corridor public hearing," is held before the route location is approved and before the state highway department is committed to a specific plan. The second hearing, called the "highway design public hearing," is held after the route location has been approved, but before the state highway department is committed to a specific design proposal. Both of these hearings are intended to give citizens the opportunity to present their views on the need for the road, its location, design, and social, economic and environmental effects. Other informal public meetings or additional public hearings are encouraged whenever they serve the public interest.

Both a corridor and a design hearing must be held for every Federal-aid highway project that is in a new location, or would have a different social, economic or environmental effect or would change the layout or function of connection roads or streets. Hearings are not required for such improvements as resurfacing, widening existing lanes, adding lanes, installing traffic lights or similar improvements.

A public hearing is to be well advertised in advance. Notices of the hearing must be published at least twice in a newspaper prior to the hearing date. Relevant public officials and private citizen groups are also to be notified. The hearings are to be held at a place and time that is convenient for the people affected by the highway.

At the hearing itself, the state highway department is to make available a map or other drawing which shows the area being considered. The various proposals will be presented by a representative of the state highway department, comments will be offered by elected and appointed officials, and statements or questions will be solicited from the participants. A complete transcript of the proceedings of public hearings must be prepared by the highway department for submission to the Federal Department of Transportation and retention in their files.

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*This reading is excerpted from U.S. Department of Transportation, Federal Highway Administration Policy and Procedure Memorandum 20-8, January 14, 1969, "Public Hearings and Location Approval."

PERTINENT LAWS AND REGULATIONS CONCERNING TRANSPORTATION PLANNING*

Following is a partial listing of the principal Federal-level laws, regulations, and directives which cover various aspects of the transportation planning and environmental assessment process with emphasis on the Federal-aid highway program.

1. *National Environmental Policy Act of 1969,* Public Law 91-190 (42 United States Code 4321-4347).

2. *Highways, Title 23* of the United States Code. Title 23 contains most of the Federal legislation that is directly applicable to the Federal-aid highway program. Among the most important provisions are the following:

   Section 109(h)--consideration of possible adverse social, economic and environmental effects

   Section 109(i)--development of highway noise standards

   Section 109(j)--consistency with air quality plans

   Section 128--public hearings

   Section 132--preservation of parklands

   Section 134--cooperative comprehensive planning

   Section 142--public transportation coordination

3. *Department of Transportation Act of 1966,* Public Law 89-670 (49 United States Code 1651-1659). This Act established the U.S. Department of Transportation. Section 2 contains a statement of purpose and outlines several aspects of the nation's transportation policy. Section 4(f) provides special protection for public parklands, recreation areas, wildlife and waterfowl refuges, and historic areas.

4. *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,* Public Law 91-646. Establishes standards and procedures governing all property acquisition and relocation programs undertaken in conjunction with Federal or Federally-assisted programs, including highways.

5. *National Historic Preservation Act of 1966,* Public Law 89-754 (16 United States Code 470). Expanded the National Register of Historic Places and created the Advisory Council on Historic Preservation.

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*Excerpted from "Getting Involved in Transportation," U.S. Department of Transportation, Office of Environment, Safety, and Consumer Affairs, 1976.

Section 106 of the Act creates a special review for all Federal projects which affect properties on the National Register.

6. *Executive Order 11514, Protection and Enhancement of Environmental Quality*, March 6, 1970. Provides additional guidance to all Federal agencies in carrying out their responsibilities under NEPA.

7. *Executive Order 11593, Protection and Enhancement of the Cultural Environment*, May 13, 1971. Expands the coverage of the National Historic Preservation Act (see Item 5, above) to include properties eligible for inclusion on the National Register as well as those which have been formally recognized.

8. Council on Environmental Quality, *Guidelines for Preparation of Environmental Impact Statements*, 40 Code of Federal Regulations Part 1500, August 1, 1973. Provides detailed guidance to all Federal agencies responsible for implementing the policies and procedures established by NEPA.

9. *Archeological and Historic Preservation Act of 1974* (May 24, 1974), Public Law 93-291. Expands the application of the 1960 Act providing for the preservation of historical and archeological data to include all Federal or Federally-assisted construction projects, rather than being limited to Federal dams and reservoir sites.

10. U.S. Department of Transportation, *Procedures for Considering Environmental Impacts*, DOT Order 5610.1B, September 23, 1974. Supplements the CEQ guidelines (see Item 8, above) and provides for the environmental assessment of all transportation programs and projects undertaken or supported by U.S. DOT and its modal offices.

11. Federal Highway Administration, *Federal-aid Highway Program Manual*. The Federal-aid Highway Program Manual contains all FHWA program directives which govern the Federal and Federal-aid highway programs. These directives were formerly issued as Policy and Procedure Memoranda (PPM's) and Instructional Memoranda (IM's), etc.

    The Program Manual is divided into seven volumes. While every volume contains items of interest to persons involved in transportation planning and environmental assessment, Chapter 7 of Volume 7, entitled *Environment*, contains the directives of greatest relevance. The contents of Chapter 7 are listed below:

    Volume 7, Chapter 7: *Environment*

    Section 1: Process Guidelines (for the development of Environmental Action Plans)

    Section 2: Environmental Impact and Related Statements

    Section 3: Noise Standards and Procedures

    Section 4: Archeological and Paleontological Salvage

Section 5: Public Hearings and Location/Design Approval

Section 6: (Reserved)

Section 7: (Reserved)

Section 8: Joint Development of Highway and Multiple Use of Roadway Properties

Section 9: Air Quality Guidelines

12. Council on Environmental Quality, *102 Monitor*. In its capacity as the administrator of NEPA, CEQ publishes a monthly listing of all draft and final Environmental Impact Statements received by the Council. In addition, the 102 Monitor contains a list of the Environmental Protection Agency's comments on pending EIS's (filed under the provisions of Section 309 of the Clean Air Act); items of current concern in NEPA case law; and information on the environmental programs of the Council.

HIGHWAY BEAUTIFICATION ACT OF 1965*

Title II of the Highway Beautification Act provides for the control of junkyards which are within 1,000 feet of the nearest edge of the right-of-way and visible from the traveled way of the interstate and Federal-aid system.

The act also provides reimbursements to the states, the District of Columbia, and Puerto Rico for 75 percent of eligible landscaping and screening costs and for 75 percent of the cost of just compensation for the relocation, removal or disposal of those junkards which cannot as a practical matter be screened.

The law further stipulates that the states must enact legislation to control future junkyard locations through licensing and zoning, and thereby avoid the expense of bringing new facilities into compliance.

Junkyards located in industrially zoned areas or in unzoned industrial areas of similar character are exempt from control under the Federal law.

Failure by the states to comply with the provisions of the Highway Beautification Act could subject them to a penalty of a 10 percent reduction of their annual Federal-aid highway funds.

To determine the extent of the problems adjacent to the Interstate and Federal-aid primary systems, all 50 states, the District of Columbia, and Puerto Rico have made a detailed inventory of all junkyards adjacent to these systems as of October 22, 1965. The inventories show that approximately 80 percent of the junkyards can be concealed from the main traveled way by natural objects, plantings, fences, or other means. The remaining 20 percent must be relocated, removed, or otherwise disposed of.

Each location to be screened must be treated individually to meet the specific condition. It is not the intent to conceal a place of active business but merely to soften the visual impact of the exposed junk. The screening should extend beyond and blend with the immediate area. The following general types of screening warrant consideration.

1. Highway border plantings of trees, shrubs, etc., of a size and density that will largely impair view across the right-of-way line.

2. Earth mounds graded and rounded to a reasonably natural appearance and planted with grass or nonmowing ground cover.

3. Open wire, chain link, wood, or other fences covered with vines to provide the effective screen.

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*This reading has been adapted from *Junk and Control: Highway Beautification Act of 1965*. U.S. Department of Transportation, Federal Highway Administration, 1967.

4. Open wire, chain link, wood, or other fences with inserted light metal, wood, or plastic strips to provide the screen cover.

5. Solid or semisolid fences such as board, picket, or sapling wood types; metal with lightweight panels, expanded mesh, and other commercially available types (100 percent screen at all angles of view is not considered essential): or other available materials such as fiber glass or asbestos board panels.

6. Walls, preferably pierced or open type, of stone, brick, concrete block, or some combination of materials in keeping with the general area, limited to practical heights.

7. Combinations of the above.

When planting alone is used, it is more desirable and economical to provide an open screen effect. Glance views of junkyards at normal highway speeds are not objectionable. A solid screen may be unnatural and inappropriate in relation to the adjacent roadside vegetation and development. Plants should be of varieties comparable to those which exist in the area. Fully mature trees should rarely be used as they may have a low survival rate. Plants should be of a variety that will grow relatively fast so that effective screening is attained within a 2- to 5-year period. In many instances, planting may be accomplished within the presently owned State right-of-way. Where this cannot be accomplished, it will be necessary to arrange with the owner to screen the junkyard on his property.

BENEFICIAL EFFECTS OF HIGHWAYS ON THE ENVIRONMENT*

Well, are we paving the country?

Far from it. All roads, including city and suburban streets, occupy less than one per cent of the land area in the United States. Federal studies in nearly 50 larger cities show that the percentage of land occupied by roads in developed areas is declining. The land is being used for larger lots, more open spaces, landscaped areas. Overall, even with the growth of new arterial highways and expressways, roads take up no greater percentage of the nation's urban areas than they did before the auto was invented.

But aren't we still building a lot of new highways?

Not as many as it would seem. The great bulk of our work, carried out by the New York State Department of Transportation and other transportation agencies throughout the nation, is being done on or near existing roads. Only a small part of our total highway construction mileage involves building roads through totally new areas.

Well, then, why are we spending so much on highway work?

Roads become worn out and outmoded. We have more people, more vehicles and, most importantly, more usage of these vehicles all the time. A highway built in the 1920s or 1930s in a rural area may well be a congested, dangerous route today, bordered by mushrooming residential or commercial development. Such a road, and there are many of them, should be replaced with a safe highway built for today's traffic demands and the demands of the future.

The interstate highway system now coming into being throughout the nation is adding 42,500 miles of new expressways. This is only a bit more than one per cent of the nation's road and street mileage, but it will carry more than 20 percent of the travel. This means freeing older roads of congestion, making all highways easier to travel and safer. In New York State, with all but 15 percent of its 1,350 miles of interstate highways in service, these new highways are removing traffic pressures in both rural and urban areas, saving time and money for highway users. Most of all, they are saving lives. Federal officials report that a life is saved each year for every five miles of new interstate highway placed in service. For New York State, that means 230 lives a year being saved now and 270 lives when the system is completed.

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*This reading consists of excerpts from "Are we Paving the Country?" distributed by the State of New York Department of Transportation and "Benefits of Interstate Highways," distributed by the U.S. Government Printing Office.

Couldn't a lot of this highway travel be accomplished by public transportation?

It can be and is, in the large cities. Elsewhere, the private passenger car is the workhorse of passenger transit, accounting for 98 percent of the intercity travel. In most cities, public transit means buses--and they need highways too. Even in the metropolitan areas, cars are needed to get to airports, train and subway stations, bus stops. The fact is that the private car gives a freedom of mobility and wide open schedule for travel that makes it the most used mode of transportation by far.

Large-scale technological improvements such as the interstate highway system often result in profound and sometimes irreversible changes in the natural and manmade environment. Interstate highways can play a vital role in protecting and enhancing the desirable elements of the physical environment, for example, by increasing opportunities for people to enjoy the beauty and uniqueness of the environment, through greater accessibility. Independent alignment of dual lane interstate highways improve erosion control, restriction of billboard advertising, and selective tree trimming, all contribute toward increasing opportunities for enjoyment of the environment while protecting its ecological structure. Also, highway agencies frequently develop or assist in programs to protect environmental features of scenic, historical, educational, recreational, symbolic, or ecological significance. For example, a number of states have used interstate construction to create recreational lakes from excavations for highway construction, rest areas utilizing Indian mounds, dinosaur tracks, or other historic or natural features.

Interstate highways can have a significant beneficial impact in reducing air and noise pollution in urban areas. Interstate highways, often constructed to bypass downtown areas, reduce unnecessary travel through downtown areas where existing noise and air pollution levels are high. Also, interstate highways eliminate considerable pollution and noise effects of stop-and-go traffic on city streets. The following (from the *American Roadbuilder,* January 1969) shows the dramatic improvements expressways can make in reducing automobile carbon monoxide emissions.

Type of Traffic Situation	*Pounds of Carbon Monoxide per Vehicle Mile*
Expressways	0.11
Arterial streets	.22
Local streets	.27
Central business district	.42

The primary reason for this very significant difference in carbon monoxide emissions is that the amount of unburned gasoline increases sharply when an engine is accelerated or decelerated. For example, when an automobile is cruising less than 2 percent of the total fuel supplied to the engine is emitted unburned through the exhaust pipe. During deceleration, this increases dramatically to 18 percent. Average speed also plays an important role. A change in speed from 20 mph to 30 mph yields a one-third reduction in total emissions. Air pollution emissions are at a minimum when vehicles are traveling at a relatively constant speed such as on interstate highways. Similarly, interstate highways reduce the more disturbing peak noise levels created by trucks and other noisy vehicles by reducing the need for acceleration and deceleration generally characteristic of travel on neighborhood streets.

Recent advances in the design of interstate highways not only make them more esthetically appealing, minimize neighborhood social and economic disruption, but are also beneficial in terms of reducing air and noise pollution levels. For example, a modern, well designed, elevated structure is visually pleasing, does not inhibit mobility and reduces noise levels in nearby areas. Depressed areas also reduce noise levels. Some interstate highways are now being designed with exclusive bus lanes which will reduce air and noise pollution by decreasing the number of autos and by providing free-flowing bus traffic. Interstate highways help reduce air pollution levels in urban areas by another indirect way. The relationship between interstate highway improvements and industrial decentralization is well known. Both the benefits and hardships of the movement of industry from the center city have been well documented. Evidence is mounting that urban air pollution problems are caused not only by the presence of such things as smoke stacks and automobiles, but by the overall spatial and temporal arrangement of these urban elements--in short by urban form.

USE OF AIRCRAFT TO HELP THE ENVIRONMENT*

Many of the positive effects aircraft have on the environment take place in relatively unpopulated areas, thereby escaping notice of the public in general. Occasionally, headlines may highlight some spectacular happening, involving aircraft, but the day-in, day-out operations take place with little fanfare. These routine aircraft operations affect the environment beneficially in the following ways.

Agriculture

Airplanes and helicopters apply seeds, fertilizers, herbicides, insecticides and growth regulators to various crops. Aircraft are able to give better coverage to the crops and can accomplish the work more quickly and effectively than ground operated equipment. In addition, many farmers are utilizing aircraft for planning and checking on farming operations.

Today practically all rice is sown from the air, along with barley, wheat, alfalfa, ladino clover and many other small-seeded plants. Tomatoes are dusted when fields are wet, before worms can cause damage. Weeds, such as blue mustard, can be controlled. This weed can reduce wheat yield by 20 bushels per acre through the existence of only nine weed plants per square foot. During and after spring rains, aircraft can make these applications without destroying newly sprouted crops or becoming mired in the mud which would entrap ground vehicles.

Even better quality, more reasonably priced clothing, can result from agricultural spraying. The boll weevil, scourge of the cotton planter in the early 20th century, has been all but eliminated through aerial application of pesticides. Defoliating agents applied to cotton plants prior to picking allow mechanical harvesters to pick bolls relatively free of leaves and other extraneous plant material. The absence of these impurities allows fewer processing actions, longer staple length, and, ultimately, a better product.

Livestock Production

The airplane has long been one of the livestock producer's handiest tools. Inventory and control of herds is now regularly accomplished from the sky, covering in a matter of hours what would have taken days or weeks by horseback.

When winter blizzards howl across the plains, piling deep snow drifts and cutting herds off from food supplies, aircraft lift hay and grain to stranded animals. Aside from the aversion of economic loss to the rancher, cattle are saved for market, thereby assuring more plentiful and less costly beef to the consumer.

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*Adapted from *Aircraft and the Environment,* Federal Aviation Administration.

Forest Management

In 1971, the U.S. Forest Service flew a total of 96,539 hours; 75,984 in fixed-wing aircraft, and 20,555 in helicopters. Of this total, 73,897 were flown in fire control activities, 5014 in timber management, and 3581 in engineering work with the balance for miscellaneous activities. In addition to government activities, private timber companies utilize aircraft extensively for management of their reserves.

Firefighting Activities

As indicated by the aforementioned statistics, forest fire control activities utilize the largest percentage of aircraft hours flown. In 1971, the Forest Service fought 2812 forest fires with the help of aircraft. Aircraft enable rapid investigation of the extent of fires and provide a picture of the best access to and means of fighting a fire once one starts. Aircraft provide a rapid method of fire-fighting by dumping borate or water, versus having ground-based fire fighters drive to the area with the attendant time delay in ground transportation. The Canadian "scooper duper" amphibian fire bomber can drop 252 tons of water in 5 hours. Helicopters are used to transport personnel to the fire area, permitting fighting of the fire while it is still in the early stages and often preventing its spread. When helicopters are unavailable or unsuitable, airplanes often carry "smoke jumpers"--specially trained parachutists who can quickly get into otherwise inaccessible areas. Aerial observation of a fire in progress enables a rapid and accurate method of directing ground personnel in their fire fighting efforts.

By saving millions of acres of valuable timber from the devastating effects of fire, a more plentiful supply of lumber is available for home building and other purposes.

Forest Seeding and Fertilizing

After trees have been cut from a forest area, sound management practices dictate a reforestation effort in order to preclude erosion and to establish a new stand of timber for future harvesting. Hand planting of seedlings is effective, but time-consuming and costly. Aircraft, dropping pine, fir or other evergreen seeds, can cover cut-over areas in a matter of minutes. Although many seeds do not germinate, experience has proven that enough will to do an effective replanting job. Once seeds have been sown, fertilizers are applied from the air to promote rooting and plant growth.

Insect/disease Control of Forest Areas

Trees, like other living plant life, are susceptible to infestation by borers, insects, fungus and other damage-causing bodies. Plant diseases, like human diseases, can assume epidemic proportions and can wipe out large forest areas if not brought quickly under control. Such diseased forest areas are quickly detectable from the air through the use of techniques such as infrared photography and other sophisticated methodology. Once detected, forests can be sprayed by aircraft to eliminate disease threats.

Selective Logging Practices

Normal logging practices often cause great devastation to forest areas. Numberous roads must be cut to allow access to logging trucks, bulldozers and other heavy equipment. Areas are clean cut to allow easy retrieval of marketable timber. The results are often scarred and eroded hillsides, unsightly piles and brush and felled trees too small to be of value, and destruction of natural wildlife cover. Although still in the developmental stages, aircraft have shown the potential to change this.

Helicopters, and in a few instances, aerial balloons, are being used to lift logs from cutting areas to a central collection point. This eliminates the need for roads and allows selective cuttings of only marketable trees. It also allows previously inaccessible areas to be selectively logged without destroying their surroundings.

Game Management

Aircraft add a great deal of flexibility in the area of game management. More accurate inventories are possible from the air. Animals can be tagged, studied and redistributed to more provident areas through the use of aircraft. In wintry weather, where starvation becomes a real threat, hay and other foodstuffs can be air-dropped at strategic locations. And, to the delight of the avid angler, remote lakes are stocked with fish.

Weather Control

Present weather experimentation, such as cloud seeding by aircraft, will undoubtedly some day allow man to more effectively control his environment. Already man can produce rain in some dry areas with some degree of assuredness. Experiments with fog dispersal are also underway. Through the use of high-flying aircraft, man can also effectively monitor such things as radiation levels, particulate matter, and upper-air moisture content. Aircraft constantly penetrate hurricanes and thunderstorms to learn more of the destructive effects of nature. Through increased knowledge, man will be able to save untold suffering and property damage now inflicted by natural forces.

Energy Related

The rising demand for more energy; electricity, gas, oil, and coal by the American public will undoubtedly require more transmission lines to move it from its source to its ultimate consumer, e.q., the controversial Alaska pipeline. Helicopters are already extensively used for transporting and erecting towers and transmission lines and pipeline components in remote areas. Aside from being more economically effective, helicopters allow construction techniques which do minimal damage to the environment.

Once these lines are installed and in operation, aircraft regularly patrol them to inspect for damage or leakage. Quick detection by aircraft of oil leaks, for example, and subsequent movement of repair crews by helicopter would prevent any substantial environmental damage.

Insect Control

Disease-carrying insects, such as the malarial mosquito, once took a large toll in human suffering. By teaming the airplane with effective insecticides, most such threats have been either eliminated or kept in check. The recent ban on widespread usage of DDT as a control agent sent currents of alarm throughout the world. Undoubtedly, other agents will be developed, but without the airplane to apply them, the agents would lose much of their effectiveness since areas such as swamps are virtually inaccessible to other means of transportation.

Efficiency as a People-mover

Aircraft produce fewer pollutants per passenger mile than any other form of motorized transportation we enjoy today, with the exception of rail travel.

As an example of relative pollution intensities, we might compare a New York City to Chicago trip by a B-727 aircraft carrying 100 passengers with a trip by auto carrying 4 passengers. The total amount of emissions is 12.8 pounds per auto passenger compared with 1.9 pounds per aircraft passenger. Economies of scale with the wide-bodied jets reduce this figure even lower.

If the 183,000,000 passengers enplaned by the domestic airlines for 1972 were forced to utilize conventional motor vehicles as an alternative, the increased number of vehicles required and the resultant pollution levels would cause considerably more pollution.

Pollution Spotters

Aircraft today are continuously monitoring antipollution efforts. Oil spills on oceans, lakes and rivers and leakages from off-shore wells can be effectively tracked and control efforts directed from aircraft. Pollution sources in rivers and creeks can be traced from the air, especially when water or surface travel is hindered by rapids, private property rights, and other obstacles. Aircraft also routinely monitor compliance with air pollution standards.

THE EFFECT OF NOISE ON MAN AND THE NATURAL ENVIRONMENT*

It is generally agreed that noise has adverse effects, residents of areas near airports and freeways need no convincing. If we are to restore our peace and quiet we must have sufficient understanding of the effects of noise to direct us to suitable action. This reading describes the effects of noise on man and on the natural environment.

Noise-induced Hearing Loss

How much noise can the human ear tolerate? Attempts have been made to answer this question for continuous noise exposure in work environments. The problem of estimating critical noise levels for transportation noise is more difficult because of its irregularities, for example, airplane departures and landings. The main impact of transportation noise on personal well-being may be its aggravation of a hearing impairment already induced by the noisy work environment. Consider, for example, an individual exposed to high noise levels at work, traveling to and from work, and at home trying to relax or sleep. This endless exposure to noise may hasten the onset of serious hearing losses, nerve damage and poor health.

It is presently an extremely difficult task to specify the allowable exposure for brief and intense (ten seconds) transportation noise exposures. A maximum tolerable limit for the unprotected ear can be set at 120-135 dB. Current data on transportation noise levels suggests that *by themselves* these irregular transportation systems maintain constant high levels of noise (85-90 dB(A) and up for 8 hours per day), then there exists a serious risk of hearing impairment.

Nervous System Responses to Noise

Noise can cause the body to activate its defense system, the autonomic nervous system, which controls many critical bodily processes (heart output, hormone control, digestion). Noise is responded to as a stress, and the more stresses bearing on man at any given time, the quicker the bodily defenses can be overwhelmed. The specific effects noise has been shown to have on man, depending on its intensity and duration, include an increase in muscular tension, sweating, metabolic changes, reduced gastrointestinal activity, nausea, headaches, tinnitus, drowsiness, respiratory irregularities and emotional disturbances. Although these effects are signs of autonomic arousal, this is *not* necessarily dangerous to the organism unless the arousal is maintained for prolonged periods of time causing depletion of bodily defenses.

Sleep Disturbance

One of the chief complaints about transportation noise is its disturbance of sleep and relaxation. The major offender is the airplane, owing

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*The reading has been adapted from *Transportation Noise Pollution: Control and Abatement*--edited by David O. Dickerson, 1970. Summer Faculty Fellowship Program in Engineering Systems Design, ASEE-NASA Langley Research Center, Old Dominion University Research Foundation.

to its loudness and unexpectedness. Disturbance of sleep is of primary importance because of its necessity for normal psychological and physiological functioning. Aggravated sleep loss has a profound effect on body health, particularly for the aged and the sick, and can become a significant factor in personal well-being. Testimony before a state legislative committee on jet noise in New York cited paranoid delusions, hallucinations, suicidal and homicidal impulses as some of the possible consequences of continuous sleep loss.

The levels of noise that sleepers can tolerate vary widely. A mother is awakened by her baby's cries while the father sleeps peacefully. A dripping faucet can prevent sleep. A jet transport screeches overhead and startles the sleeper awake. Although it is not obvious what characteristics are shared by these sounds, certain fundamental rules can be set forth:

- The louder the noise, the greater the disturbance of sleep
- The more meaningful the sound, the greater the chance of disturbance
- The more unexpected the noise, the greater the chance of being awakened
- The greater the presence of certain personality traits, i.e., neuroticism, the greater the sensitivity to noise
- The younger the child, the greater the susceptibility to interference from aircraft noise
- The greater the age or poorer the health, the lower the resistance to noise disturbance

Psychological Effects of Noise

Noise can have a deleterious effect on man's day to day existence. There is no reported research on the psychological effects of transportation noise, but there are some inconsistent findings on noise in the work environment. A large portion of the research concludes that noise causes a significant increase in work errors and the quantity of work produced. The same applies to students in school. Other studies conclude that individuals with high levels of anxiety perform better under noisy conditions than under quiet ones. Most of the research agrees that the psychological effects of noise vary with the quality of the sound--its duration, direction, frequency and unexpectedness.

Effects of Transportation Noise on the Natural Environment

Noise seems to accompany man wherever he goes. Outdoor recreation has become more and more mechanized and more and more noisy. The burgeoning popularity of trail bikes and snowmobiles has taken man into the quiet forest and mountains in a very intrusive and noisy manner.

The noise of snowmobiles terrifies wildlife already immobilized by deep snow and in a weakened condition. The exertion of fleeing through deep snow is harmful and can be fatal. Low flying aircraft also constitute a source of terrifying noise which affects wildlife and farm animals.

THE AIRPORT NOISE PROBLEM*

The major cause of noise complaint in the last 15 years is the noise around airports. Community responses to airport noise are in some ways unique but in others resemble complaints about any noise irritation.

Studies of relations between aircraft noise exposure and annoyance have helped determine major acoustical and sociological factors affecting annoyance. Annoyance in general results from interference with normal living activities from the noise itself and from vibrations it causes in structures. Activities commonly disrupted include TV and radio enjoyment, rest and sleep, conversation, reading or concentrating, eating and working.

Disturbances can be more insidious and subtle than we may recognize. In one survey a totally deaf man, using sign language, indicated he was unable to sleep because aircraft caused vibrations which shook the house and bed. Residents near major airports have indicated alterations in social relations due to noise. Speech interference has led to friction and hostility among family members and sometimes deterioration of interfamily relationships.

Some of the more important sociopsychological factors known to affect strongly the annoyance produced by a given aircraft noise intrusion include

1. Fear of aircraft crashing
2. General attitude about noise
3. General attitude about residential environment
4. Beliefs about the preventability of aircraft noise
5. Belief in the importance and value of airports and air traffic
6. Belief in the possible effects of noise on health

These factors can be as important as the noise exposure itself in determining annoyance reactions. Thus an individual's reaction to noise seems to be only a part of a more general adjustment to the local environment.

Research suggests that the actions of people sufficiently annoyed with aircraft noise vary from complaining to officials to attempting to abate the effects of noise by keeping windows shut, sleeping with earplugs, and insulating homes. These individual responses mold into community efforts as noise levels and exposure times increase and as it becomes clear that the failure of individual remedies makes a community wide or political solution necessary.

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*The reading has been adapted from *Transportation Noise Pollution: Control and Abatement*--edited by David O. Dickerson, 1970. Summer Faculty Fellowship Program in Engineering Systems Design, ASEE-NASA Langley Research Center, Old Dominion University Research Foundation.

Community reaction to airport noise may be conveniently depicted as a chain of possible events:

EXPOSURE → ANNOYANCE → COMPLAINT → PROTEST

There is no evidence that the people who complain or protest noise are extra-sensitive to that noise, but they do tend to be more convinced that the noise could be prevented and that it affects their health.

THE NOISE CONTROL ACT OF 1972*

Background Legislation

Recognition that noise is an environmental problem that affects people other than workers has been late in coming. Federal noise legislation first appeared in 1968 when Congress directed the Federal Aviation Administration (FAA) to establish rules and regulations to control aircraft noise.

At the state and local level, laws tended to treat noise as a public nuisance, and enforcement was both difficult and spotty. More recently some jurisdictions, notably California and Chicago and New York City, have established new laws and ordinances that are based on noise generating characteristics of specific equipment and, hence, are easier to enforce.

The Clean Air Amendments of 1970 called for the establishment of an Office of Noise Abatement and Control in the U.S. Environmental Protection Agency (EPA). The legislation also called for public hearings of environmental noise and a special report to the Congress on the problem, incorporating the results of the public hearings and other special studies. Information from this EPA report as well as extensive Congressional hearings formed the basis of the Noise Control Act of 1972.

The Noise Control Act of 1972

The Noise Control Act of 1972 represents the first major Federal attempt to eliminate excess noise at the design stage of a wide variety of new consumer products.

Major Provisions

The EPA is directed to develop and publish information on the limits of noise required for protecting public health and welfare as well as a series of reports to identify products that are major sources of noise and to give information on the techniques for controlling noise from such products.

Using the criteria thus developed, the EPA Administrator is required to set noise-emission standards for products that have been identified as major sources of noise and for which standards are deemed feasible. The law requires such standards to be set for products in the categories of *construction equipment, transportation equipment* (except aircraft), *all motors and engines, and electrical and electronic equipment*. It also grants authority to set for other products, standards deemed feasible and necessary to protect public health and safety.

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*Taken from the *Noise Control Act of 1972; Highlights*. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

EPA has authority to require the labeling of domestic or imported consumer products as to their noise-generating characteristics or their effectiveness in reducing noise-generating characteristics or their effectiveness in reducing noise. Manufacturers or importers of non-conforming or mislabeled products are subject to fines of up to $25,000 per day for each violation and to imprisonment for up to one year. Manufacturers must issue warrants that their regulated products comply with Federal standards at the time of sale. They are also required to maintain records and provide information, including production samples, if requested by EPA.

The EPA Administrator also is to prescribe noise-emission standards for the operation of *equipment* and *facilities* of *interstate railroads, trucks,* and *buses*.

All Federal agencies are directed to use the full extent of their authority to insure that purchasing and operating procedures conform to the intent of the law. EPA may certify low-noise emission products for purchase by the Federal government.

Aircraft Noise

Under the Noise Control Act of 1972, the EPA Administrator is required by mid-1973 to make a comprehensive study of aircraft noise and cumulative noise exposure around airports. Using this information, EPA is to submit to the FAA proposed regulations to control aircraft noise and sonic booms. After a hearing and further consultation with EPA, the FAA may adopt or modify the proposed regulations. The FAA may reject the proposals if it believes they are unsafe, technologically or economically infeasible, or not applicable to certain aircraft. However, it must publicly explain its specific reasons for rejection. A continuing review and consultation role is provided for EPA.

An End to Noise Pollution

This comprehensive nature of the Noise Control Act of 1972 brings under Federal regulation for the first time, nearly all of the major new sources of noise. An incentive now exists for the full employment of noise-control technology that is already available, and the day when quiet is restored appears closer. We know how to build quieter. Now the law is to give the nation the stimulation to do it.

TRANSPORTATION AND ENERGY CONSERVATION*

Transportation is a high-energy function. Approximately 60 percent of the liquid fuel consumed in the United States is used for transportation purposes.

Within the transportation sector, highway vehicles are the major consumer, accounting for nearly 40 percent of all the petroleum used in the United States.

1974 GASOLINE CONSUMPTION

Vehicles		*Barrels/day*
Passenger cars		
Getting to work		1,760,000
Pleasure driving		1,360,000
Personal business		1,020,000
Business, government		800,000
	Subtotal	4,940,000
Trucks		1,470,000
Farm vehicles		200,000
Other uses		200,000
	Total	6,810,000

Transportation's petroleum requirements *doubled* between 1954 and 1974.

Ninety-two percent of the more than 2.4 trillion "person miles" of travel annually in the United States are by automobile.

Seventy percent of all travel in the United States is by automobile; 27.6 percent by commercial air transportation; 1.5 percent by bus, and 0.5 percent by passenger rail.

Motor vehicles, therefore, are of paramount significance in U.S. fuel conservation efforts, because they are the predominant users.

In 1970 oil imports cost the United States $2.7 billion. In 1974 the U.S. paid *$23.6 billion* for the oil needed to bridge the difference between domestic production and nationwide demand.

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*This reading has been adapted from a U.S. Department of Transportation Fact Sheet of June 10, 1975.

From the days of oil surpluses in the 1960's, the United States has moved to a dependency situation. In 1974 imports were needed to supply 37 percent of our petroleum needs; unless conservation, energy conversion, and energy efficiency efforts succeed, U.S. dependency on foreign oil could rise to 50 percent by 1980.

While estimates of undiscovered oil reserves vary greatly, the known recoverable reserves of U.S. oil are reported to be 45 billion barrels. In view of contemporary consumption rates, limited reserves, and declining domestic production, petroleum independence is not attainable as a short-term goal.

Fuel conservation is essential for economic as well as for supply reasons. The motor vehicle, as the major user (about 45 percent of the petroleum used annually in the U.S.), is potentially the greatest saver--especially in view of the vast quantities of fuel wasted through carelessness, inefficiency, unnecessary driving, and driving at higher speeds than necessary.

How the 55 mph Speed Limit Saves Fuel

The nation's 105 million automobiles, 26 million trucks, and 400,000 buses consume about 75 percent of the petroleum used for transportation purposes in the United States, nearly 107 billion gallons in 1974.

The government has challenged the auto industry to achieve a 40 percent improvement in fuel efficiency by 1979, to an average passenger car performance of nearly 20 miles per gallon.

Tests by the Federal Highway Administration* show improvements in automobile fuel economy ranging from 11.8 to 28.5 percent by driving at 55 mph rather than 70 mph, depending on the size of the car.

COMPARATIVE CONSUMPTION RATES

Miles/hour	*Subcompact*	*Compact*	*Standard*	*Luxury*
30	31.45 mpg	21.33 mpg	20.33 mpg	18.33 mpg
40	35.19	21.33	20.00	19.28
50	33.05	18.94	17.50	15.62
55	31.91	18.17	16.84	14.92
60	30.78	17.40	16.17	14.22
70	22.62	15.36	14.86	12.74

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*"Effects of Speed on Automobile Gasoline Consumption Rates," a Federal Highway Administration mileage study. Copies available on request from the FHWA, Washington, D.C. 20590, Attention: HPA-1.

About half of all vehicle miles are driven under conditions where speeds above 55 mph are possible. The potential savings if 90 percent of the driving population comply with the 55 mph speed limit are estimated at 200,000 barrels of gasoline per day--20 percent of the total savings advocated by President Ford for 1975.

Average interstate speeds declined 7.5 mph in 1974. Surveys show that only 6 percent of highway vehicles exceeded 65 mph in 1974, compared to 31 percent in 1973. An important part of the 3.4 percent reduction in gasoline consumption in 1974 was due to lower speeds.

BIBLIOGRAPHY

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The Bibliography contains educational materials for teachers and students. It consists of selected

- Books, pamphlets, and flyers that can be read by teachers and students alike
- Periodicals

The individual entries are presented in the following format:

** *Title of Work,* author, date of publication. Number of pages or list of materials. Price.

Type of Material — Description of material with evaluation of material's quality and relevance for transportation and the environment education.

Source from which material may be obtained.*

For purposes of convenience, the teacher and student materials have been rated by the designation of stars next to the material description (see sample above). The stars represent the following evaluation:

No stars	Material is useful, but fair
(*) One star:	Material is good
(**) Two stars:	Material is very good
(***) Three stars:	Material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality and relevance.*** As such, the absence of a teaching material or a low rating does not per se indicate the material is poor. It may be excellent but simply not relevant to this chapter's content. In addition, any absences may be due to the author's oversight.

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*Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found at the end of this Manual.

Teacher and Student Materials

* *Needed: Clean Air; The Facts About Air Pollution*, 1972. 15 pages. 25¢.

Pamphlet

Useful but very sketchy overview of the effects of air pollution on health, energy depletion, and economic costs. Transportation is included as one of the sources of pollution. Some students may find the cartoon format condescending or childish.

Channing L. Bete Co., Inc.
45 Federal Street
Greenfield, Massachusetts 01301

* *Vanishing Air*, by John C. Esposito, 1970. 328 pages. 95¢.

Paperback

Highly critical account of government's attempt to regulate air pollution and industry's alleged attempts to avoid self-regulation. Chapter 1 on general causes and effects of air pollution and section of Chapter 6 on air pollution from airplanes are relevant and informative. Major attention is paid to automobile pollution; author blames the government for not enforcing strict standards and the industry for not taking actions of its own and attempting to avoid Federal and state controls.

Grossman Publishers
125A East 19th Street
New York, New York 10003

* *Air Pollution: The World's Exhaust*, 1971. 62 pages. $1.00.

Book

Overview of the air pollution problem, with discussions of smog, what air pollution is, automobile pollution, health effects, effects on the weather, and who should be responsible for preventing air pollution. Approach is to raise questions rather than present solutions.

Pendulum Press, Inc.
The Academic Building
Saw Mill Road
West Haven, Connecticut 06516

** *Health Effects of Environmental Pollution*, 1973. 20 pages. 30¢.

Pamphlet

Highly useful overview of the effects of air, water, and noise pollution on human health.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Air Pollution Primer, 1969. Price varies.

Handbook — Handbook that explains air pollution's processes, sources, characteristics, and effects. Special sections on weather and radioactivity.

Available from local
Tuberculosis Association

Air Pollution Workbook, 1970. $1.00.

Pamphlet — Concise explanations of the atmosphere, characteristics of specific pollutants, biological effects of pollution, bibliography and references.

Scientific Institute for Public Information
30 East 68th Street
New York, New York 10021

** *Automotive Fuels and Air Pollution*, 1971. 32 pages. 40¢.

Pamphlet — Detailed account, for the layman, of automobile pollutants, their effects, and what can be done to eliminate or reduce them.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Noise and You, 1970. 15 pages. 25¢.

Pamphlet — Brief overview of the nature of noise and the dangers of too much and too loud noise. Not tied in specifically with transportation noise. Informative, but in a cartoon format that some students may find condescending or childish.

Channing L. Bete Co., Inc.
45 Federal Street
Greenfield, Massachusetts 03101

* *Noise Pollution*, 1972. 13 pages. 35¢.

Pamphlet — Informative discussion of what sound is, how it affects our health, and general ideas for solutions. Noises from transportation sources are discussed.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 5500-0072

* *The Tyranny of Noise,* by Robert Alex Baron, 1970. 294 pages. $7.50.

Book Comprehensive account of causes of noise pollution, price in terms of health, dollars, and environment quality, political aspects of noise pollution control, and citizen actions to promote noise abatement. Section on citizen action is detailed and very useful, but somewhat idealistic.

St. Martin's Press, Inc.
175 Fifth Avenue
New York, New York 10010

Noise: The Unseen Enemy, 1972. 63 pages. $1.00.

Book Overview of the noise pollution problem, with discussions of what sound is, physical and psychological effects, and supersonic aircraft noise. Well illustrated, but little of booklet deals with transportation noise pollution per se.

Pendulum Press, Inc.
The Academic Building
Saw Mill Road
West Haven, Connecticut 06516

Transportation Noise and Its Control, 1972. 27 pages. 70¢.

Pamphlet Informative, not too technical discussion of the nature of noise pollution, the decibel unit of measurement, the extent of noise caused by cars, trucks, planes, and rapid transit, and possibilities for reducing or eliminating transportation noises.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 50000-0057

** *Transportation Noise Pollution: Control and Abatement,* 1970. 190 pages. $6.00.

Pamphlet Very informative, in places technical, discussion of the causes of transportation noise pollution and what can be done about them. Excellent charts, graphs, and cartoons.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Stock Number N71-15557

* *The Noise Control Act of 1972: Highlights*, 1973. 4 pages. Free.

Flyer Brief, useful overview of the law's major provisions, with paragraphs on the effects of noise, some common noisemakers, and citizen suits.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

* *Noise Assessment Guidelines*, 1971. 29 pages. $1.25.

Pamphlet Informative, but somewhat technical discussion of how noise pollution can be minimized in the construction of highways, airports, and railways. Worksheets for recording relevant information are provided.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 2300-1194

Aircraft and Air Pollution: Selected Readings, 1971. 61 pages. Price not listed.

Bibliography Bibliography of papers, reports, and periodical articles on environmental pollution caused by airplanes.

Department of Transportation
Office of Administrative Operations
Library Services Division
400 7th Street, S.W.
Washington, D.C. 20590

** *Aircraft and the Environment*, 1973. 13 pages. Free.

Pamphlet Detailed description of the positive effects airplanes have on the environment, from crop spraying to firefighting. Indispensable supplement to other accounts of airplanes' harmful effects on the environment.

Federal Aviation Administration
Aviation Education Programs Division A6A 300
Office of General Aviation Affairs
Washington, D.C. 20591

* *Cost of Air Pollution Damage: A Status Report,* 1973.
73 pages. $2.50.

Pamphlet A review of studies on the cost of air pollution damage on human health, vegetation, materials, and residential property values. Transportation pollution is not singled out. Very analytical.

National Technical Information Service
5285 Port Royal Road
pringfield, Virginia 22151
Stock Number PB-222 040

Aviation and the Environment, 1971. 19 pages. Free.

Bibliography Bibliographical references for materials on aviation's response to improving the environment. Explores in some detail the relationship between airplanes and the environment. List is admittedly pro-airplane manufacturers.

Department of Transportation
Federal Aviation Administration
800 Independence Avenue
Washington, D.C. 20591
Stock Number GA-300-89

Airport Problems: Access and Air Traffic Congestion: Selected Readings, 1971. 34 pages. Price not listed.

Bibliography Bibliography of articles, reports and papers on airport access and air traffic delays. Both technical and nontechnical studies are listed.

Department of Transportation
Office of Administrative Operations
Library Services Division
400 7th Street, S.W.
Washington, D.C. 20590

* *Railroads and the Environment in Rail Freight Operations,* 1972. 28 pages. 30¢.

Pamphlet Concise, informative discussion of railroad pollution and abatement, including odors, engine exhaust emissions, sanitary waste control, noise, and land use. Photographs.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

** *Unsafe at Any Speed,* by Ralph Nader; revised edition, 1973. 367 pages. $1.95.

Paperback

New edition of now classic study of car industry's alleged lack of attention to safety. Chapter 4, "The Power to Pollute," attributes the failure to control automobile pollution to industry delays, collusion, and miserliness. Book as a whole is indispensable for this view toward responsibility for pollution and efforts to control it, even though most of book is about automobile safety.

Bantam Books Inc.
666 5th Avenue
New York, New York 10022

Rethinking Your Automobile, 1973. 6 pages. Free.

Flyer

Brief discussion of consumer's role in reducing use of cars in view of the energy shortage.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

*** *Getting Around: People and the City,* 1974. 48 pages. $1.29.

Pamphlet

Informative, thought-provoking case studies and discussions on urban transportation, including commuting, rapid transit, citizen action, dial-a-bus, mass transit, banning cars, and the Bay Area Rapid Transit (BART) in San Francisco. Discussion questions are provided. Well illustrated; photographs.

Scott, Foresman and Company
1900 Eastlake Street
Glenview, Illinois 60025

** *Dead End: The Automobile in Mass Transportation,* 1972. 231 pages. $1.45.

Paperback

Comprehensive discussion of role of automobile in contemporary American life and detrimental effects it has had. Included are discussions of the energy problem, air pollution, freeways, and alternatives to the automobile.

Penguin Books Inc.
7110 Ambassador Road
Baltimore, Maryland 21207

The Freeway in the City, 1968. 141 pages. $3.00.

Book

Somewhat technical discussion of the principles of urban freeway planning and design that considers environmental concerns in terms of the view from the freeway, location of the freeway, and highway structures. Well illustrated.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

* *The Accessible City*, by Wilfred Owen. 150 pages. $2.95.

Paperback

General discussion of big-city transportation problems, with emphasis on rational planning to avoid problems. Chapter on public transport provides useful background information on one alternative to the automobile. Sections on transportation planning consider environmental concerns of land use and esthetics.

The Brookings Institute
1775 Massachusetts Avenue
Washington, D.C. 20036

** *Highways and Our Environment*, by John Robinson, 1971. 332 pages. $24.00.

Book

Well written, highly informative, and impassioned account of how highways and the automobiles they serve have blighted the environment with litter, concrete, air and noise pollution, and visual unsightliness. Chapters on citizen action and the highway establishment are very useful. One appendix lists citizen action groups and government agencies involved in transportation and the environment. A profusion of valuable photographs makes the work unique.

McGraw-Hill Book Company
1221 Avenue of the Americas
New York, New York 10020

Superhighway--Superhoax, by Helen Leavitt, 1970. 95¢.

Paperback

A polemic with facts about Federal highway programs, funding and operations; cites problems and issues in localities throughout the U.S.; special chapter on urban highway problems; information on alternative transit systems. (Not evaluated.)

Ballantine Books, Inc.
201 East 50th Street
New York, New York 10022

Junkyard Control: Highway Beautification Act of 1965, 1967.
15 pages. Free.

Pamphlet Two-page description of provisions of the act as they affect junkyard control. Other pages provide before and after photographs of junk yards with and without adequate screening from highway viewing.

U.S. Department of Transportation
Federal Highway Administration
Bureau of Public Roads
400 7th and D Streets, S.W.
Washington, D.C. 20590

Benefits of Interstate Highways, 1970. 28 pages.

Pamphlet Report to Congress describing user, economic, and community benefits deriving from interstate highway construction.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Paperback *Urban Parks and Roads*, by Douglas C. Smith, 1971. 54 pages. $1.50. (Not evaluated.)

Highway Users Federation for Safety and Mobility
1776 Massachsuetts Avenue, N.W.
Washington, D.C. 20036

* *Park and Recreational Facilities: Their Consideration As An Environmental Factor Influencing the Location and Design of a Highway*, 1971. 47 pages. 45¢.

Pamphlet Informative discussion of what criteria should be considered when building a highway to protect playgrounds, parks, and parkways.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

** *Community Involvement in Highway Planning and Design*, 1973.
53 pages. Price not Listed.

Conference Proceedings Conference proceedings with informative discussion on the adequacy of public hearings, the characteristics of an effective prehearing community involvment program, and what actions can be taken to achieve early and effective public involvement.

U.S. Department of Transportation
Federal Highway Administration
Office of Environmental Policy
400 7th Street, S.W.
Washington, D.C. 20590

* *Community Participation in Highway Planning*, 1972. 59 pages. Price not listed.

Report Recommendations to the Department of Transportation on how to promote citizen participation in highway planning efforts. Also discusses such issues as how citizens can become motivated to participate in planning and how one can find representative, indigenous leaders who will represent a community in the planning process.

U.S. Department of Transportation
Office of Consumer Affairs
400 7th Street, S.W.
Washington, D.C. 20590

Governmental Approaches to Automobile Air Pollution Control, 1971. $3.00.

Pamphlet Discusses industry's control of auto emissions, consumer control, and advantages and disadvantages of standard-setting and traffic system designs. (Not evaluated.)

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Publication No. PB203-952

An Anti-Pollution Program: Natural Gas Powered Vehicles, 1972. 6 pages. Free.

Pamphlet Report on dual-fuel system in cars enabling them to operate on either natural gas or gasoline. Clean-burning properties of natural gas are explained. Well illustrated.

General Services Administration
18th and F Streets
Washington, D.C. 20405

*** *A Citizen's Guide to Clean Air*, 1972. 95 pages. Free.

Pamphlet An extremely useful, detailed account of the clean air laws and how citizens can advocate and plan for the control of air pollution. One chapter deals with auto emission controls, another with the citizen's legal rights, and a third with the citizen's role in policy making.

The Conservation Foundation
1717 Massachusetts Avenue, N.W.
Washington, D.C. 20036

** *The Campaign for Cleaner Air*, by Marvin Zeldin, 1973. 28 pages. 35¢.

Pamphlet Informative, factual account on clean air, including the Clean Air Act, implementing the law, controlling automobile pollution, and the citizen's role.

Public Affairs Pamphlets
381 Park Ave. South
New York, New York 10016
Pamphlet No. 494

Action for Clean Air: A Manual for Citizen Participation in State Implementation Plan Proceedings under the Clean Air Amendments of 1970, 1971. Price not listed.

Pamphlet Explains in detail the act and regulations for implementation plans; makes specific suggestions for action by individuals and by organized citizen groups. Emphasizes legal procedures and citizens' legal rights. (Not evaluated.)

Natural Resources Defense Council
36 West 44th Street
New York, New York 10036

* *More Fun per Gallon: A Guide to Fuel Conservation with an Outboard Powered Boat*, 1973. 16 pages. Free.

Pamphlet Useful tips on how to conserve gasoline while motorboating.

MORE FUN PER GALLON
Marketing Communications Department
Johnson Outboards
200 Sea-Horse Drive
Waukegan, Illinois 60085

* *A Citizen's Guide to Clean Water*, 1973. 95 pages. Free.

Pamphlet An extremely useful, detailed account of the clean water laws and how citizens can advocate and plan for the control of water pollution. However, laws and pamphlet deal primarily with pollution from industrial sources, rather than transportation facilities.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

** *Process Guidelines: The Action Plan,* 1972. 9 pages. Free.

Flyer Brief discussion of state action plans under which state must consider economic, social, and environmental factors when planning highway construction.

U.S. Department of Transportation
Federal Highway Administration
Office of Environmental Policy
400 7th Street
Washington, D.C. 20590

* *Replacement of State and Local Publicly Owned Facilities Acquired For Federal-aid Highways,* 1974. 10 pages. Free.

Flyer Brief description of Federal laws that permit Federal participation in the costs of acquiring substitute sites for facilities displaced by highway construction. Includes examples of building replacement assisted by Federal funds.

U.S. Department of Transportation
Federal Highway Administration
400 7th and D Streets, S.W.
Washington, D.C. 20590

** *Your Rights and Benefits as a Highway Relocatee under the Federal Relocation Assistance Program,* 1974. 54 pages. Free.

Pamphlet Discusses possible reimbursement for moving costs and obtaining comparable replacement housing for homeowners, renters, businesspersons, and farmers.

U.S. Department of Transportation
Federal Highway Administration
Office of Right-of-Way
400 7th and D Streets, S.W.
Washington, D.C. 20590

*** *Rites of Way: The Politics of Transportation in Boston and the U.S. City,* by Alan Lupo, Frank Colcord, and Edmund P. Fowler, 1971. 294 pages. $3.95.

Paperback Detailed account of how community opposition in metropolitan Boston forced the state and local governments and quasiindependent commissions to abandon plans to construct freeways in and around the city. Book also discusses who makes transportation decisions in other major U.S. cities and the politics of such decisions. Excellent example of citizen action seeking to alter the environmental effects of transportation decisions on population displacement, traffic congestion, land use, and esthetics.

Little, Brown and Company
34 Beacon Street
Boston, Massachusetts

** *Ecotactics: A Sierra Club Handbook for Environment Activists*, 1970. 287 pages. 95¢.

Paperback Informative essays on the nature of several different aspects of the environmental crisis, including transportation's effects on the environment. Especially useful for descriptions of methods by which citizens can individually and collectively work to reduce pollution. Many readers, however, will find some of the tactics beyond their ability, energy, or interest, and inappropriate on ethical grounds. Many tactics described with reference to industrial pollution are equally applicable to pollution caused by transportation. Appendices list books, environmental groups and societies, and key Federal agencies of relevance to activists.

Pocket Books
630 Fifth Avenue
New York, New York 10020

** *Action for Environmental Quality*, 1973. 21 pages. Free.

Pamphlet Discussion of standards and enforcement measures for air and water pollution.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

** *Don't Leave It All to the Experts: The Citizens Role in Environmental Decision Making*, 1972. 19 pages. Free.

Pamphlet Identification of methods by which citizens can protect the environment, including becoming informed, knowing the law, lobbying, fighting for funds, and knowing your rights.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

* *Citizen Action Can Get Results,* 1972. 20¢.

Pamphlet Three somewhat superficial case studies of how community political action successfully reduced environmental pollution. One case study on air pollution indirectly involves auto pollution. However, the case studies are useful as examples of citizen action, even though they are not directly related to transportation's environmental effects.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

The Federal-aid Highway Program, 1975. 7 pages. Free.

Flyer Brief description of the nature of the Federal government's aid to states for highway construction, including mention of how citizens can influence decisions, laws providing compensation for persons displaced by highway construction, and laws protecting the environment.

U.S. Department of Transportation
Federal Highway Administration
400 7th and D Streets, S.W.
Washington, D.C. 20590

* *Citizen Participation in Transportation Planning,* 1973. 142 pages. $5.00.

Booklet Papers from a conference on the Boston Transportation Planning Review which consider issues of citizen participation well beyond the Boston experience. Papers include discussion of the politics of transportation planning, nonwhite viewpoints, rural citizen involvement, and ecological concerns in transportation planning.

Highway Research Board
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

* *Protecting the Environment in the Federal-aid Highway Program,* 1976. 7 pages. Single copies free.

Flyer Identifies legislation designed to protect the environment from harmful effects of highways, discusses the role of the Federal Highway Administration in carrying out these laws, and suggests how the public can become involved in the effort to protect the environment.

U.S. Department of Transportation
Federal Highway Administration
400 7th and D Streets, S.W.
Washington, D.C. 20590

* *In Productive Harmony: Environmental Impact Statements Broaden the Nation's Perspectives,* 1972. 13 pages. Single copies free.

Pamphlet Describes the provisions of the National Environmental Policy Act of 1970 and the nature of an environmental impact statement, including the Environmental Protection Agency's role in a statement's development.

U.S. Environmental Protection Agency
Office of Public Affairs
Washington, D.C. 20460

*** *Getting Involved in Transportation,* 1976. 12 pages. Single copies free.

Pamphlet Describes the nature of environmental impact statements and offers specific suggestions for how the public can become involved in their formulation and in transportation planning in general.

U.S. Department of Transportation
Office of the Secretary
Office of Environment, Safety & Consumer Affairs
400 7th and D Streets, S.W.
Washington, D.C. 20590

** *Readings for the Eco-activist,* 1972. 41 pages. Price not listed.

Bibliography A bibliography of environmental publications of the Federal government for young persons interested in involvement in environmental problems. There are chapters on air, water, and noise pollution that include materials on transportation pollution.

Division of Information Services
Office of Library Services
U.S. Department of the Interior
Washington, D.C. 20240

** *Groups That Can Help: A Directory of Environmental Organizations,* 1972. 12 pages. Free.

Directory Extremely useful listing of organizations that can be contacted by individuals seeking information and advice on environmental problems, including problems created by transportation.

U.S. Environmental Protection Agency
Office of Public Affairs
Waterside Mall
Washington, D.C. 20460

Your Right to Government Information: How to Use the FOIA, 1975. 23 pages. Free.

Flyer Detailed information which describes citizens' rights under the Freedom of Information Act of 1966 which provides that records of Federal government agencies shall be made available to members of the public and outlines the procedures by which private citizens may secure these records.

American Civil Liberties Union
22 East 40 Street
New York, New York 10016

* *The Voice of the Transportation Consumer: Executive Summary,* 1975. 108 pages. $5.25.

Pamphlet/ Report This is a comprehensive and forthright report to the Secretary of Transportation on nationwide consumer public hearings conducted by the (Department of Transportation) Office of Consumer Affairs during 1971-1974. Presents in summary but highly readable fashion the results of 54 hearings conducted in 34 cities and towns. The report analyzes 1280 complete questionnaires received at the hearings. The report covers all aspects of transportation, but indirectly treats transportation and the environment. A full report of the hearing results is also available and runs to 656 pages.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Catalog No. PB 241764

Periodicals

In addition to the periodicals listed below, teachers and students can also consult in libraries the *Reader's Guide to Periodical Literature* for past articles on public transportation.

Changing Times
The Kiplinger Magazine
Editors Park, Maryland 20782

Consumer News
Federal Office of Consumer Affairs
Superintendent of Documents
U.S. GPO
Washington, D.C. 20402

Consumer Reports
Consumer's Union
256 Washington Street
Mt. Vernon, New York 10550

Environment Action Bulletin
33 East Minor Street
Emmaus, Pennsylvania

Highway and Urban Mass Transportation
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

IRT Newsletter
Institute for Rapid Transit
Suite 508, 1612 K St., N.W.
Washington, D.C. 20006

Mass Transit
530 National Press Building
Washington, D.C. 20045

Newsletter of the American Council on Consumer Interests
238 Stanley Hall
University of Missouri
Columbia, Missouri 65201

Of Consuming Interest
Federal State Reports
P.O. Box 986
Arlington, Virginia 22216
(703) 527-4950

Transit Journal
The American Public Transit Association
1100 17th Street, N.W.
Washington, D.C. 20036

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

Transportation U.S.A.
U.S. Department of Transportation
Office of Public Affairs
400 7th and D Streets, S.W.
Washington, D.C. 20590

TRANSPORTATION
SAFETY

TRANSPORTATION SAFETY: AN OVERVIEW

The Problems

The overview at the beginning of this Manual has already pointed out that travel and transportation play a tremendously important role in the lives of Americans, as all of us drive and walk almost every day, and as we frequently ride buses, trains, planes, and boats or ride around on recreational vehicles. Most of that travel is safe, speedy, and pleasant. But when millions of people travel billions of miles, it is not surprising that accidents do happen. Greater safety can be achieved if the persons who travel--that is, all of us--become better informed about transportation services, the different modes of transportation, the special advantages of some, the special dangers of others, and the things that can be done to improve our safety while we travel.

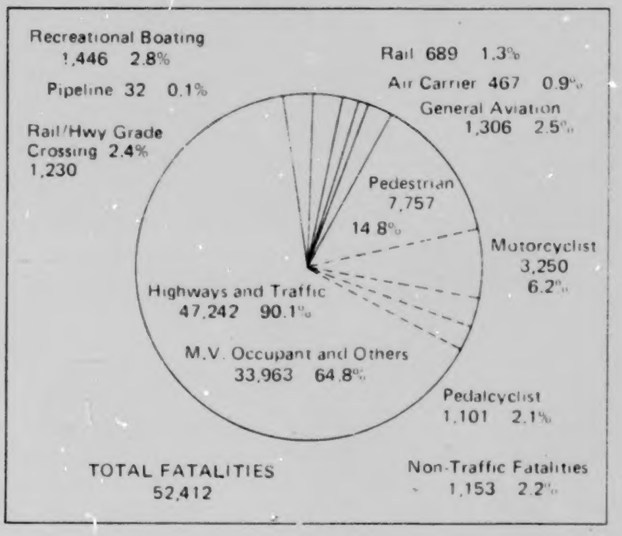
The safest way to travel is to walk. When we walk, we can control where we go, when we go, how fast we go, or if we go at all. Yet even pedestrians have accidents. 300,000 to 400,000 pedestrian accidents occur each year, with 8000 to 9000 fatalities.

Americans drive a staggering number of miles each year. The safety record of American drivers is good: there is only one traffic fatality for every *25 million* miles driven. Yet the record could be even better, and we should work to reduce the number of traffic fatalities from 50,000 each year to a lower number.

Travel for vacation and recreation should be enjoyable and safe--and most of it is. Few things are more tragic, however, than a recreational trip marked by an injury or even a death. Accidents do happen: in 1974 there were, for example, more than 1400 fatalities from boating and almost 1000 fatalities even from bicycling.

The following chart, adapted from *U.S. Transportation Information Report*, presents the total figures and relative percentages of transportation fatalities for 1974:

TRANSPORTATION FATALITIES: 1974



The Solutions

Increased safety depends on Federal, state, and local governments, who must promote transportation safety by providing assistance for planning, development, and financing of improved transportation vehicles and facilities and enact legislation to encourage the manufacturers of vehicles to develop the safest possible vehicles and which will stimulate the public to engage in safe travel practices. In addition, local transit authorities--public transportation companies, taxi companies, ferry agencies--must provide maximum safety provisions for their customers. Citizens/consumers must be careful by using different modes of transportation with full awareness of their dangers and what should be done to minimize these dangers; purchase vehicles that are safe to operate and maintain them in proper operating condition; persuade other people to travel safely; and participate in transportation planning to ensure that safety needs are adequately considered in the development and servicing of vehicles and transportation facilities. Finally, teachers must guide students to a better understanding of the dangers involved in all kinds of travel and of ways to minimize or prevent them. Transportation consumer education can offer the student a unique opportunity to develop awareness and skills essential to acquiring responsible transportation habits and playing a role in supporting and improving transportation safety in the community.

This chapter focuses on teaching transportation safety by developing consumer skills that are particularly appropriate to adults. The learning activities are designed to:

- Make students aware of the dangers involved in all modes of travel, including walking, boating, bicycling, automobile driving, motorcycling, and using recreational vehicles
- Encourage students to practice safety when operating vehicles and as passengers riding in vehicles
- Motivate students to encourage other people to engage in safe travel practices
- Teach students to consider the safety implications of transportation in deciding whether to buy a particular vehicle and, if so, what kind of vehicle to buy
- Develop skills in making use of emergency vehicles that are available in the local community and in facilitating the task of these vehicles while en route to or from an emergency

MINI-UNITS AND ACTIVITIES

Activity #	*Activity Description*	*Class Time (periods)*
	Mini-unit 9 **Learning about automobile safety**	
31	Students identify and then discuss common dangerous driving habits.	½-1
32	Students act out the parts in the script of "Fleming vs. Rondo - A Hearing." Then, without a script, they complete the hearing and try to come to a conclusion.	1½-2
33	Class discusses how useful safety belts are in reducing injuries and fatalities in automobile accidents.	1-2
34	Students learn and discuss the facts about drinking and driving.	1
35	Students role-play a situation in which a friend who has been drinking excessively is about to drive.	1
	Mini-unit 10 **Buying and maintaining a car**	
36	Students discuss the safety considerations to keep in mind when buying a new or used automobile.	½-1
37	Students role-play purchasers "buying" a car	1-2
38	Students analyze automobile advertisements and discuss why safety considerations are not usually included in the sales pitch.	1
39	Students question automobile mechanics concerning regular maintenance that car owners can perform or should have garages perform in order to keep their cars running safely.	2-3
	Mini-unit 11 **Walking and driving**	
40	Class discusses the pedestrian dangers young children face.	2-3
41	Students identify pedestrian hazards and formulate appropriate community countermeasures to enhance pedestrian safety.	1½-2
	Mini-unit 12 **Learning about emergency vehicles**	
42	Class discusses the nature of emergency vehicles.	½-1
43	Students evaluate the emergency vehicle needs of their community and develop a plan to provide those vehicles and services that are lacking.	½-2
	Mini-unit 13 **Being safe while traveling for fun**	
44	Class discusses boating safety.	1
45	Students and teachers discuss why fueling a motor boat can be hazardous and what steps need to be taken to make it a safe procedure.	1
46	Students read brochures, instructional materials, and other promotional and descriptive literature about recreational vehicles available from dealers and manufacturers.	1-2
47	Students poll motorcycle drivers and salespeople, pedestrians, automobile drivers, and other groups on motorcycle safety.	2

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 9

LEARNING ABOUT AUTOMOBILE SAFETY

The automobile is the single most important means of transportation in the United States. It is a great convenience but also a cause of, or factor in, many accidents. This mini-unit, therefore, tries to call attention to some of the common causes of automobile accidents, as well as to the things that can be done to make driving and riding in a car a safer activity.

Several topics are combined in this mini-unit. Each of them could be treated at greater length; we touch on them here in order to give your students a feel for some of the things they can do in order to be safer in a car. First, they can and should recognize bad driving habits, what causes them, and what can be done to avoid them. Second, we acquaint them, through a scripted role-play, with an accident that was caused by an action that didn't "deserve" to have bad consequences: a driver acting on a friendly impulse stopped for a hitchhiker and caused a series of collisions. Third, we deal with the question of safety belts and try to overcome the misconception that safety belts aren't really necessary. Finally, in the last two activities we deal with a deadly combination--drinking and driving, probably the major killer of young adults.

Among the major concepts treated are

- Many things which people commonly do while driving are dangerous.
- Hitchhikers often contribute to accidents.
- Safety belts are effective in reducing injuries and deaths.
- Alcohol increases the likelihood of accidents.

MINI-UNIT 9 LESSON PLAN

Learning about automobile safety

Activity #	*Activities*	*Class Time*
31	DESCRIPTION: Students identify and then discuss common dangerous driving habits. GOAL: To know and recognize common dangerous driving habits.	½-1 period
32 Spirit Masters #4 and #5	DESCRIPTION: Students act out the parts in the script of "Fleming vs. Rondo - A Hearing." Then, without a script, they complete the hearing and try to come to a conclusion. GOAL: To understand the probable causes of an accident and the contributions of the persons, automobiles, and the environment to the accident.	1½-2 periods
33	DESCRIPTION: Class discusses how useful safety belts are in reducing injuries and fatalities in automobile accidents. GOAL: Appreciation that safety belts do save lives and prevent injuries.	1-2 periods
34 Spirit Master #6	DESCRIPTION: Students learn and discuss the facts about drinking and driving. GOAL: To understand how alcohol affects people and makes driving more dangerous for them.	1 period

MINI-UNIT 9 LESSON PLAN (CONTD.)

Learning about automobile safety

Activity #	*Activities*	*Class Time*
35	DESCRIPTION: Students role-play a situation in which a friend who has been drinking excessively is about to drive. GOAL: To understand the feelings of someone who has been drinking and who gets advice from sober people.	1 period

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Total Class Time: 5-7 periods.

ACTIVITY #31

Mini-unit Topic: Learning About Automobile Safety   **Approximate Class Time:** ½-1 period

Capsule Activity Description: Students identify and then discuss common dangerous driving habits.

Goal:
To know and recognize common dangerous driving habits.

Concepts Treated:
- Many things people commonly do while driving are dangerous.
- Many things people do frequently that are not dangerous most of the time become dangerous when done while driving.
- Drivers often know that their habits are dangerous but persist in them.
- Passengers often have difficulty influencing the actions and habits of drivers.

ACTIVITY

The class breaks into small groups and each group identifies unsafe driving habits and behaviors. However, these behaviors are not to include actual driving practices normally discussed as part of driver education--such as failing to signal turns, passing on curves, and coming to a complete stop at stop signs. Rather, students identify those dangerous habits and behaviors not often associated in the public mind with automobile safety and not addressed in many public safety messages. Examples of such behaviors include failure to completely clean windshield and rear window during or after snowstorms; daydreaming; girl/boy watching; looking for signs or street numbers; reading maps; engaging in personal hygiene (combing hair, cleaning ears); allowing boisterous or easily panicked animals to be unrestrained in the car; driving barefooted; eating and drinking; talking animatedly; chasing bugs which fly into the car; restraining children; viewing scenery; being distracted by passengers who are talking excessively, pointing out scenery or events, horsing around, arguing, or being affectionate; turning around to look at back seat passenger while driving; driving while sleepy or very upset; lighting a cigarette, cigar, or pipe;

avoiding or cleaning ashes from a cigarette; searching for things in pockets, wallets, purses, glove compartments, or back seats; and fiddling with radios or tape decks.

Groups present their lists to the class, and a master list of dangerous driving habits is developed.

Follow-up discussion is held on one or more of the following issues:

1. How many people know these are dangerous habits but engage in them anyway?

2. If people do not realize these are dangerous habits, how can they be brought to this realization?

3. If people are aware of the dangers but continue to practice the habits, what, if anything, can be done to help them change their habits?

4. Should passengers inform drivers of their dangerous driving practices? If so, are there ways of doing this without making the driver angry or defensive?

5. How can drivers who have difficulty avoiding these dangerous habits but would like to change them develop the self-discipline or self-awareness to do so?

6. How can drivers effectively and politely persuade passengers not to disturb their concentration?

Evaluation Method:

Students role-play situations in which a driver or a passenger is engaged in unsafe practices. Students must identify the unsafe practice and try to persuade the other person to stop it.

Variations and Supplementary Activities:

Students can poll drivers, passengers, and one another on the extent of these dangerous practices.

Students can interview instructors in driver education schools on the most common unsafe driving habits novice or experienced drivers engage in and how these instructors attempt to promote safe driving habits.

Students can research the extent to which car theft is related to automobile safety. For example, many accidents result from joyriding. Car owners and drivers can reduce joyriding by not leaving their keys in the car and keeping it locked when it is not in use.

ACTIVITY #32

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students act out the parts in the script of "Fleming vs. Rondo - A Hearing." Then, without a script, they complete the hearing and try to come to a conclusion.

Goal:

To understand the probable causes of an accident and the contributions of the persons, automobiles, and the environment to the accident.

Concepts Treated:

- On-ramps and off-ramps are very dangerous places.
- Hitchhikers often contribute to accidents.
- Cars don't stop "on a dime."
- At highway speeds, a moment's inattention can lead to an accident.
- It is difficult to assign a single cause to an accident.

ACTIVITY

Divide the class into groups of six students. Assign each student a part from the script (Spirit Masters #4 and 5). Each group acts out the script. When they come to the end of the script, students should continue in their roles and try to bring the hearing to a close and arrive at a settlement.

Before the students begin to act out their own "hearing" remind them that traffic accidents are usually a combination of three elements: man, machine, and environment. Human failures--including negligence, carelessness, and drinking abusively--contribute to many accidents. The automobile occasionally has defects in braking, steering, and other essential components that may cause or contribute to accidents, as well as poorly designed interior features that can cut or bruise occupants who are in an accident. Finally, the environment can foster crashes or increase their severity. For example, trees can obscure vision and faulty traffic signs can initiate accidents.

Allow enough time for the groups to arrive at a resolution (approximately 10-15 minutes might well be sufficient).

When the group hearings are over, each hearing officer states the resolution arrived at or the reasons for the impasse. Then as a class discuss the number or complexity of issues involved; any difficulties or problems groups had conducting their hearings; who they (as students) felt was to blame for the accident and why; and how the accident might have been prevented.

Evaluation Method:

Students write out their own resolution of the case and give reasons for their resolution.

If a student feels he cannot resolve the question of responsibility, he must write down what he feels he lacks in order to come to a resolution.

Students, on the basis of this accident, make suggestions for how future accidents at this interchange might be avoided.

Variations and Supplementary Activities:

If you have some gifted actors in the class, you may assign them the six parts of the scripted play and have them act the play in front of the rest of the class. When the actors come to the end of the script, divide the rest of the class into groups of six and have them carry on the hearing in their groups.

Students can investigate the extent to which accidents are caused by highway vandalism--theft and defacement of traffic signs and signals.

Students can investigate the role which poor road conditions (not including weather) play in accidents.

Students discuss the dangers of hitchhiking. This play suggests that it may cause accidents. In addition, there are other dangers, both for the hitchhiker and for the person who picks up the hitchhiker, such as being robbed, mugged, raped, or murdered. Students can research statistics on these risks by interviewing a police officer, having one come to class to talk about hitchhiking, or checking newspaper files on statistics for such crimes in the local community, the state, or the nation.

ACTIVITY #33

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1-2 periods

Capsule Activity Description: Class discusses how useful safety belts are in reducing injuries and fatalities in automobile accidents.

Goal:

Appreciation that safety belts do save lives and prevent injuries.

Concepts Treated:

- There is a high likelihood that any given motorist will be involved in an accident.
- Safety belts are effective in reducing injuries and deaths.
- Most accidents happen at slow speeds.
- In an accident, it is better to remain in the car than to be thrown from it.

ACTIVITY

Begin this activity by having students fill in the brief questionnaire about safety belts facts and figures provided on the page after next. Tabulate the answers on the chalkboard. These answers will indicate where the areas of greatest knowledge and ignorance are.

Depending on what the tabulation shows, have the class discuss one or more of the following topics:

- The value of safety belts for children
- The importance of safety belts for passengers
- Myths about safety belt use
- Importance of using shoulder harnesses
- How safety belts can prevent accidents from happening

During the discussion, you may want to provide additional information, especially of factual material, based on the pages that follow the questionnaire. These pages are taken from the brochure *Automobile Safety Belt Fact Book*.* You may also want to assign a student or group of students to study the pages (or the entire booklet) and report back to the class.

Evaluation Method:

Students analyze statistics on accidents and safety belt use. They obtain the statistics either from the attached reading or by individual research in the library. If they can find statistics on Australia or the Province of Ontario, where safety belt use is mandatory, this might be especially illuminating.

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*Available for 55¢ from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; stock number 5003-0068. (Allow 10 weeks for delivery.)

Sample Questionnaire on Safety Belt Use

		True	False
1.	Very few people will get into a serious automobile accident during their lives.	☐	☐
2.	Accidents at slow speeds rarely involve serious injuries or deaths.	☐	☐
3.	Most accidents causing injury or death occur at speeds of less than 40 miles per hour.	☐	☐
4.	There is no clear evidence that safety belt use saves lives.	☐	☐
5.	Even wearing safety belts, people in many serious accidents are still usually killed.	☐	☐
6.	Although safety belts are usually a good idea, there are often times when people's lives are saved in car accidents because they were not wearing belts and were thrown free from a crashing, burning or sinking car.	☐	☐
7.	Shoulder belts add a great deal to the protection offered by lap belts.	☐	☐
8.	Passengers in the rear seats of cars don't need to wear safety belts as much as people in front seats.	☐	☐
9.	A frequent complaint people express who were in accidents while using safety belts is that they suffered bruises and soreness.	☐	☐
10.	Safety belts sometimes prevent accidents because they can increase the driver's control over the car.	☐	☐
11.	If people drive very carefully, they don't need to use safety belts because they can make sure they don't get into accidents.	☐	☐
12.	Accidents occur more often on city streets than on freeways and turnpikes.	☐	☐
13.	Most Americans use safety belts most of the time.	☐	☐

Correct Answers

1. F
2. F
3. T
4. F
5. F
6. F
7. T
8. F
9. F
10. T
11. F
12. T
13. F

THE FACTS ABOUT SAFETY BELTS*

Almost everybody has some conception of how safety belts contribute to personal safety. People know that belts reduce injuries caused by striking "hostile surfaces" in the car interior. (This is the so-called "second collision." The first collision occurs when the vehicle strikes, or is struck by, another object. The second collision occurs when the occupant of the vehicle is flung against the instrument panel, windshield, windows and side panels, roof, doorknobs, steering wheel, and so forth. Incidentally, any one occupant can have several second collisions during a single accident, depending on how much he gets tossed around inside the car.) People are also aware that belts increase safety by holding the occupants inside the car, avoiding injury from ejection.

People are generally less aware of other contributions. For example, in a collision, the occupants can fly into or roll over each other; by keeping them in place, belts reduce their chances of becoming another source of injury to each other. Belts can also help to prevent accidents. By keeping the driver firmly in place, they increase his control of the vehicle. By keeping the driver in a comfortable position, they can reduce fatigue and make driving a little safer. Children who are firmly buckled in are less likely to distract the driver's attention from the problems of driving. And so it goes.

However, the average person's knowledge in this area is probably superficial and somewhat vague. Maybe that is one reason why belt usage is so low--people "sort of know" that belts help, but they don't know exactly what they do or how well they do it. The short paragraphs below should help in that regard. They quote or paraphrase information that appears more extensively elsewhere.

It *can* happen to us: *there is a high probability that the average motorist will be involved in an accident someday soon.*

> Within the next 16 seconds--and every 16 seconds thereafter--somebody will be injured in a motor vehicle accident. Every ten minutes, someone will be killed. By the end of this week, about 1000 people will have been killed and 40,000 injured. Within a year, this will total about 2,050,000 deaths and injuries.

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*Excerpted from *Automobile Safety Belt Fact Book* (U.S. Department of Transportation, National Highway Traffic Safety Administration).

> One thousand Americans are killed every week in traffic accidents. Almost 10,000 are injured every day. Annually, this approximately equals the number of babies born in the United States yearly. Statistically, this means that "every American born from today forward may be killed or injured in an automobile crash."
>
> Of the 139 drivers "at fault" (that is, responsible for the accident) at least half had been drinking. Even good drivers are at the mercy of bad drivers.
>
> Many motorists believe that it is not necessary to use belts when traveling at lower speeds. This is not true. More than half of the accidents causing injury or death occur at speeds less than 40 miles per hour. In rural areas, one-half of the fatal accidents occur at speeds under 50 mph. Almost 50 percent of all rural accidents happen at speeds under 30 mph.
>
> In one statistical analysis of 28,000 accident cases, fatalities of "nonbelted" motorists occurred over the whole speed scale, starting as low as 12 mph.

Yes, they *really* do work: *some research findings about the effectiveness of safety belts.*

> If all passenger car occupants used lap belts, some 10,000 lives would be saved each year. Combination (lap/shoulder) belts would save some 20,000 lives.

In a study of 160 collisions,

> at least one occupant involved in each collision was wearing a combination (that is, lap and shoulder) belt. Ninety-six of the vehicles sustained heavy damage of the type that usually involves injury to the occupants. However, 99 percent of the occupants using combination belts had either no injury, or only minor injury.

In a study of the effectiveness of the three-point harness in 28,000 accident cases:

> Without the harness: fatal injuries throughout the whole range of accident speeds. With the harness: no deaths at speeds under 60 mph. The average injury-reducing effect of the harness was 40 percent to 90 percent.

From data on 14,261 occupants of passenger cars involved in rural crashes--2,359, or 16.5 percent, were wearing a lap belt (no shoulder restraint usage reported).

> In similar crashes, the unbelted occupants were injured substantially more frequently and more severely than the belted ones. In round figures, failure to use seat belt(s) increased injury risks as follows: of immediate death or severe injury... by 100 percent; of more than trivial injury...by 70 percent; of any injury...by 40 percent.
>
> For all practical purposes, use of seat belts prevented ejection from the vehicle. This effect was estimated to account for about one-quarter of the above risk differentials. The remainder, or three-quarters of the risk differentials are attributed to the effect of seat belt(s) in (1) preventing injury entirely and (2) alleviating injury sustained within the vehicle.

The probability of death is almost five times greater when the motorist is thrown from the automobile ("ejected"). If ejection could be totally eliminated in automobile accidents, about 5000 to 6000 lives could be saved each year.

Seat belts are the most effective way to prevent ejection.

Even if all they did was prevent ejection, seat belts could reduce accident deaths by about 25 percent.

During an accident, people may also come into violent contact ("impact") with the car itself--doors and side panels, steering assemblies, instrument panels, and roofs. These "second and third collisions" are a major cause of death.

Lap belts permit the occupant's upper torso to "jackknife" forward and strike the car interior. However, the belts tend to reduce this impact to tolerable levels. By the time the belt user begins to jackknife forward, the belt has already reduced the forces of impact. Shoulder belts prevent jackknifing, reducing injuries even further.

> In a collision, children who are riding in the rear seat tend to become "airborne." They fly forward and are injured by impact with windshields, rear-view mirrors, instrument panels, heaters, etc. They also cause injury to the front-seat passengers by hurtling into them.
>
> An adult in the rear seat tends to injure his face and head against the front seat. Legs are trapped under the front seat and broken. Also, an adult in the rear seat will hurtle forward, causing injury to front-seat passengers.

Safety belts can even keep accidents from happening. When seat belts keep the driver behind the wheel, everyone is safer.

> *Item:* An unbelted driver took the corner too fast. He was thrown off balance and lost control of the car. A collision resulted.
>
> *Item:* A car sideswiped a parked car. The driver (unbelted) lost control of the car, which swerved across the roadway where it collided with an on-coming car. Little if any injury resulted from the collision with the parked car, but serious injury occurred to occupants of both cars in the head-on collision.
>
> *Item:* While crossing the Golden Gate Bridge, the right-front wheel of the bus ran over a cement block which had fallen onto the roadway. The impact threw the driver out of his seat, into the stairwell. Out of control, the bus ran over the side of the bridge. There was one survivor.

In short, by keeping the driver in place, in control of the car, seat belts can prevent accidents from happening and can keep mild accidents from turning into serious ones.

During an accident, children who are not belted become a hazard to everybody by becoming airborne and hurtling into other occupants. Unbelted children can also cause accidents. For example, a driver's attention was diverted when one of her children fell off the seat. She took her eyes off the road, swerved, and ran into a truck. The score:

Driver: Minor bruises

Child 1: Severe cut on head

Child 2: Concussion

Child 3: Near-fatal skull fracture

Child 4: Severe head injuries

There are two points to observe: one, if all the children had been restrained, the accident would not have happened; two, if an accident does happen, seat belts protect the children from injury.

The point is, would you rather have a sore shoulder or a skull fracture? *Some answers to the rumors about injuries caused by safety belts.*

> In the vast majority of accident cases, the seat belt presents no hazard to occupants except possibly in unusual and isolated instances. Under some extremely severe conditions, seat belts could cause serious injury; however, even so, the injured motorists would probably be even worse off without belts.
>
> If a car is hit from the side at the point where a motorist is sitting, he is likely to be injured whether he is or is not wearing a seat belt. However, this happens in only a small proportion of all accidents.

Based on a study of 382 accidents:

> In no case did a belt cause an injury that was more severe than the injury that would have resulted had a belt not been worn.

In an analysis of 28,000 accident cases:

> Injuries caused by the safety belt were reported in 34 cases for drivers and 25 cases for the front-seat passenger.

	Driver	*Front-Seat Passengers*
Slight single rib fracture (no hospitalization; in two cases, belt was worn too loose)	10	10
Pain in chest and bruises	6	5
Slight to moderate fracture of chest bone	3	1
Bruises and soreness in lap area	3	2
Bruises and soreness in shoulder area	1	2
Fracture of collar bone	3	2
Slight superficial wound of neck	1	1
Soreness in back	2	
Slight injury, not defined		1
Multiple rib fracture	5	1

Most injuries reported to be caused by belts occurred in accidents in which occupants not wearing belts were seriously injured, and in accidents at high speeds.

Therefore, the injuries caused by the seat belts were very slight in comparison with the injuries sustained by motorists not wearing belts in the same accidents.

Myths and Facts about Safety Belt Use

The Myth: If I'm just going shopping, why bother? I don't need a belt driving around town at low speeds.

The Fact: Injury-causing accidents occur at all speeds. Furthermore, the accident rate is lower on turnpikes and freeways than on city streets.

The Myth: What if the safety belt traps me in a burning or submerged automobile?

The Fact: Without a belt, the motorist may be dazed or stunned by the crash; this would increase the time it takes to get out of the car. With a belt, the motorist is more likely to be unhurt, alert, and capable of getting out quickly. Therefore, the belt will speed up, rather than slow down, the escape process.

The Myth: Many motorists have been "saved" by being thrown out of the car.

The Fact: There is virtually no situation in which people are not better off inside the car.

The forces in an accident are so great that a person ejected from an automobile can be flung 40 to 50 feet or more from the car. (One body was found 150 feet from the car from which it had ejected.) Whether this distance is covered through the air, scraping along the ground, or both, it is highly likely to have serious results. In other cases, the car door is sprung, the motorist falls out, and the car rolls over and crushes him. Despite any emotional fantasies about "being thrown clear," sheer common sense--based on extensive statistics--says it's better to stay inside the car.

A station wagon carrying a family of six was struck from the rear. It ran off the road and rolled over. The mother flew out the door and was killed when her head hit a rock. Three of the children stayed in the car; all had broken bones, but lived. The father stayed in the car and was not injured. When the police arrived, the father was frantically searching for the eighteen-month-old boy his wife had been holding on her lap. Half an hour later, they found the baby. Otherwise unharmed, he had drowned because he was hurled into six inches of water.

The probability of death is almost five times greater when the motorist is thrown from the automobile.

Safety Belt Use

Belt usage varies from trip to trip. The same person may wear a belt on one kind of trip, not wear it on another. For "short" trips--under 25 miles each way--the drivers report belt usage as follows:

Always use: 17 percent of the drivers
Sometimes use: 32 percent of the drivers
Never use: 51 percent of the drivers

For "longer" trips--26 to 150 miles each way:

Always use: 39 percent
Sometimes use: 26 percent
Never use: 35 percent

For "cross-country" trips--over 150 miles each way:

Always use: 44 percent
Sometimes use: 28 percent
Never use: 28 percent

Ninety-five percent of all the trips made by these drivers were short trips: of every 20 trips, 19 were short; only 66 percent of the drivers go on longer trips, and only 33 percent make cross-country trips.

The drivers who use lap belts most often also tend to use shoulder belts most often. Similarly, drivers who use lap belts least tend to use shoulder belts least.

ACTIVITY #34

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1 period

Capsule Activity Description: Students learn and discuss the facts about drinking and driving.

Goal:
To understand how alcohol affects people and makes driving more dangerous for them.

Concepts Treated:

- Alcohol affects reaction time of drivers.
- Alcohol increases the likelihood of accidents.
- Alcohol is involved in 50 percent of all fatal traffic accidents.
- Blood alcohol content is an objective measure of whether a driver was "under the influence."
- Body weight affects alcohol's effect on the drinker.

ACTIVITY

Begin this activity by having students fill in a brief questionnaire about drinking and driving. A sample poll is provided on Spirit Master #6. Tabulate the answers on the chalkboard and then either (1) pass out duplicated copies of the information about drinking and driving provided at the end of this activity and have students read and then discuss the information provided, comparing it with their answers to the questionnaire; (2) distribute copies of one of the brochures suggested in the Bibliography and have students read and discuss the data provided; or (3) use the information provided as the basis of a lecture about drinking and driving. You should guide the discussion of the class so that it concentrates on a specific aspect of the drinker-driver problem, such as the effects of alcohol abuse on driving ability; the relationship between alcohol use and traffic accidents; and myths about drinking's effects on driving.

If the class shows and maintains interest, you can guide the discussion to related issues, such as:

- Why do people drink excessively when they know they will be driving?

- What are the excuses some drunk or impaired people use to convince themselves they are capable of driving safely?

- Should friends or relatives try to convince each other not to drive after drinking excessively or not to ride with drivers who are impaired?

- Are there ways people can be motivated not to drive when impaired, not to drink excessively when they will be driving, and not to ride with drivers who are impaired?

Answers to Sample Quiz on Spirit Master #6

1. c
2. d
3. c
4. d
5. c
6. a
7. c
8. d
9. d
10. b
11. c
12. h
13. b
14. d

Evaluation Method:

If possible, have students visit a local court and observe the trial of a person charged with driving under the influence of alcohol. Then the students summarize the case and its outcome. (Note: Real names should not be used.) If this is not possible, have students interview local officials about the incidence of driving while under the influence. Possible persons to interview are the police chief, court officials (such as the court administrator), insurance company adjusters. Students write up the interviews and draw conclusions.

DRINKING AND DRIVING*

How is Drinking Related to Traffic Accidents?

Although up to half of all motorists drink alcohol and then drive at some time, these drivers do not significantly increase the risk of accidents, either because they drink in moderation or they allow sufficient time to elapse before driving. However, despite the responsible drinking and driving behavior of most citizens, a strikingly large percentage of traffic accidents and fatalities involve excessive alcohol use on the part of drivers and pedestrians. The U.S. Department of Transportation (DOT) has concluded on the basis of a number of studies that in nearly 50 percent of all fatal automobile crashes one of the drivers was drunk. This means that drinking is involved in about 25,000 of the 53,000 annual fatal highway accidents in the United States. Furthermore, DOT estimates that alcohol abuse is involved in 800,000 of the 14 million annual nonfatal accidents occurring in the United States. In short, DOT has concluded that alcohol is the most important single factor leading to fatal crashes and one of the major factors causing nonfatal crashes.

Most of the drinking motorists tested for drinking after involvement in fatal and serious accidents have been drinking very heavily--six or more drinks within one to three hours before driving. Based on this finding and through examination of the community records of such drivers, DOT believes that two-thirds of all traffic fatalities in which alcohol is a factor involve problem drinkers and alcoholics. Social drinkers are involved in only one-third of these crashes, but the problem of the social drinker who had one too many is a major problem, too.

What is the increased likelihood of a driver who drinks getting into an accident? The Department of Transportation estimates that a person who has had five to eight drinks a couple of hours before driving is six times more likely to get into an accident than a driver who has not been drinking. A person who has had nine or more drinks before driving is 25 times more likely to crash.

Recently, however, some researchers have questioned the reliability of the studies on which the DOT figures are based, noting that many people involved in traffic accidents are never tested for alcohol consumption and that these untested people probably include many drivers and pedestrians who have not been drinking. Moreover, these dissenting experts point out that just because someone has been drinking, even excessively, before a crash, this does not prove that he must have been responsible for the accident, or if he was, that alcohol was the cause. Nevertheless, these researchers conclude that even when in some future study *all* victims of accidents *are* tested for prior drinking, "it may be found that the actual frequency of 'alcohol

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*Adapted from U.S. Department of Transportation, *1968 Alcohol and Highway Safety Report* and other sources by Peter Finn.

involvement' in fatal crashes is in the range of 25 to 34 percent..."* In other words, alcohol still appears to play a major role in traffic fatalities and presumably accidents. At the very least, then, we can conclude that the more alcohol in someone's bloodstream before driving, there is a greater likelihood that (1) he will crash; (2) he will be responsible for any crash in which he is involved; and (3) any such crash will be fatal or severe.

When Will Drinking Impair Driving Ability?

Although drinking and driving can mix when the drinking is moderate or when enough time elapses between the time a person drinks and the time he drives, just how many drinks impair a person's ability to drive safely? Alcohol-traffic safety experts have conducted enough tests to answer this question. They have determined this number of drinks by scientifically testing motorists' driving performance while totally sober and then after drinking varying amounts of alcohol. However, in order to make these tests accurate, the experimenters measured not just how many drinks the drivers consumed, but *how much alcohol was in their bloodstream.* This was essential because alcohol affects people only when it enters their bloodstream and only when it has reached a certain level in their bloodstream. This amount of alcohol in the blood is called *blood alcohol content* or *BAC.*

Only four factors can affect the amount of alcohol in a person's blood--his BAC:

> The *amount* of pure alcohol he drinks is what matters, not the number of drinks. For although one beer, one glass of wine, and one mixed drink all contain approximately the same amount of pure alcohol (1 ounce), certain cocktails (like martinis and manhattans) that combine two types of alcohol contain much more pure alcohol (1½-3 ounces). In addition, some people make mixed drinks with considerably more alcohol than the one ounce normally included.
>
> Whether the person has *eaten* before drinking or eats while drinking is important. Food will slow down the passage of alcohol into the small intestine and from there into the bloodstream. Moreover, the food adds water to the stomach, thereby diluting the alcohol.
>
> How much a person *weighs* also affects the results. Weight affects BACs because the more someone weighs, the more blood he has. And the more blood he has, the

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*Richard Zylman, "Overemphasis on Alcohol May Be Costing Lives," *Police Chief* (Vol. XLI, No. 1, January 1974), page 67.

more he must drink to reach the same BAC level as someone who has less blood--that is, weighs less.

How long the person *waits* after drinking or between drinks influences BACs because the longer the wait, the more time the liver and body tissues have to oxidize the alcohol and eliminate it from the body.

Nothing else affects a person's BAC. Mixing drinks will not cause increased intoxication nor will cold showers, drinking hot coffee, or a host of other so-called cures for drunkenness reduce intoxication, simply because they don't change the amount of alcohol *in a person's blood* and thereby alter alcohol's affects on his behavior.

To return, then, to the original question of how many drinks will impair a motorist's ability to drive a car safely: For an adult male who weighs 175 pounds, has not eaten before drinking, and does not wait very long before driving after drinking, a BAC of .05 percent (as few as three drinks) is *likely* to impair his driving performance to some extent. Impairment can occur, however, at BACs as low as .03 and .04 percent (1-2 drinks) for some people.*

There is one other element involved in predicting how drinking will affect driving performance. Drivers who have consumed moderate amounts of alcohol (1-2 drinks), have moderate BACs (.03-.05 percent), and are experienced drinkers and experienced drivers can partly compensate for their impairment because they are familiar with what alcohol does to them and can make a conscious effort to compensate for its effects by concentrating harder, driving more slowly, and avoiding busy streets. However, this ability to compensate for impairment decreases rapidly with higher BACs, is of little value to the novice driver or inexperienced drinker, and is of no value to any motorist who is confronted by something unexpected while driving.

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*Although several studies have indicated that drivers who have drunk a little alcohol (1-2 drinks) and have low BACs (.01-.04 percent) before driving are involved in fewer accidents and fatalities than alcohol-free drivers, this may be because such drivers compensate for their drinking by driving even more carefully than they do when sober. Moreover, "better drivers are most likely to drive at low BACs and are also most likely to drive during periods of least traffic when it is easiest to compensate for impairment." (Richard Zylman, "The Variability of Collision Involvement at Low Blood Alcohol Concentrations: The Grand Rapids Curve Explained," *Blutalkohol: Alcohol, Drugs and Behavior* (Vol. 9, No. 1, January 1972), page 30.)

What Effects Can Alcohol Have on Driving Performance?

Below is a list of some of the physical and behavioral effects drinking *can* produce on drivers with low BACs and *will* produce on drivers with high BACs that will increase their risk of crashing.

Behavioral Effects. These include (1) *reduced ability to judge things,* such as distance, speeds, angles, etc.; (2) *dulling of critical judgment capacities* and therefore reduced awareness of one's deteriorating performance: even though the motorist is driving poorly, *he* doesn't think he is; (3) *increased tendency to take risks,* such as passing on curves and hills, because of feeling over-confident; and (4) *reduced ability to concentrate,* for example, on speed or intersecting traffic. Other effects include (5) *concentration on only one part of the traffic scene* and ignoring other parts. This reduces the driver's ability to deal with many rapidly changing factors, such as altered speed limits, stop lights, curves, and lateral traffic and pedestrians. Finally, there is simple (6) *forgetfulness,* such as not turning lights on at night, leaving high beams on, not signalling turns, etc.

Physical Effects. These include (1) *impaired reflexes* which in particular reduce the ability to deal with the unexpected, like skids, blinding by oncoming high beams, sudden appearance of other cars or pedestrians, changing signal lights, road construction, faulty or wet brakes, etc. Another effect is (2) *reduced vision;* this includes reduced peripheral vision (increased difficulty seeing what is going on to the left and right); reduced night vision (something made even more difficult in smokers, since carbon monoxide in the blood also reduces night vision); reduced depth perception (ability to determine the relative nearness or distance of an object); and reduced sharpness of perception, culminating in double vision at high BACs. Finally, there is also *sleepiness,* with resulting reduced concentration and vision.

Not only are drivers who drink likely to experience these effects after a few drinks and sure to experience them after several, if these drivers are already in poor health, fatigued, taking other drugs (especially tranquilizers and barbiturates), or inexperienced at drinking or driving, the impairing effects of alcohol will be magnified even more.

Some of the actual dangerous *driving behaviors* that excessive drinking can cause include performing normal driving tasks more slowly, including braking, turning, signalling, stopping; passing on curves and hills; weaving; driving excessively slowly or fast; running stop lights and stop signs; responding tardily or overreacting to unexpected occurrences (like children running out) or to expected happenings (like curves); failing to see soon enough or clearly enough, or failing to see pedestrians and cars that suddenly appear; driving the wrong way down one-way streets; and crossing the double white lines and driving out of lane.

Statistics have long indicated that drivers less than 25 years old are involved in a disproportionate number of *all* accidents based on the number of licenses held. However, this basis for estimation does not take into account the *exposure* of youths to accidents--that is, it is not based on a per unit mile of driving. Since it is possible that youths drive more miles per year than older drivers, it seems reasonable to infer that while youths are indeed involved in a higher proportion of accidents than older citizens, this proportion may not be as great as has been frequently assumed.

Moreover, several studies have shown that teenagers may not drive after drinking as often as many people believe, certainly not as often as motorists in their early twenties. In fact, the heaviest frequency of driving after drinking occurs among motorists *over* 25 years of age.

Thus, while the evidence indicates that youths are clearly involved in drinking and driving accidents, the extent and nature of the problem may not be as great as for older citizens. Nevertheless, teenage drinking and driving definitely merits special attention for the following three reasons:

> While youthful drivers in general may not drive after drinking as often as adults do, studies indicate that youths who *do* drink even *moderate* amounts of *alcohol and then drive are much more likely to be involved in accidents* than are older drivers. Education is therefore needed to inform youthful, novice drinker-drivers that *even small amounts* of alcohol *for them* are of greater danger than for older, experienced drinker-drivers. The explanation for this high teenage accident rate after drinking even one or two drinks is that not having had as much experience as older people with how alcohol affects them, many teenagers have not yet learned how to *compensate* for their impairment (for example, by driving more slowly, leaving before dark, concentrating harder, or avoiding heavy traffic) and not having had as much driving experience as older motorists, they cannot benefit as much from automatic driving habits and automatic responses to normal and to unexpected motoring events as can older motorists.

No matter how many alcohol-related accidents teenagers are involved in, *there are enough such crashes* to warrant special attention in order to reduce the number of alcohol-related accidents and deaths.

Regardless of how many alcohol-related accidents teenagers are involved in, these young people are going to grow up into adults who, on a statistical basis, may be involved in as many as 30,000 fatalities and 800,000 alcohol-related accidents a year. If we hope to reduce this number of *adult* crashes, we must educate youths before drinking and driving habits have become ingrained.

ACTIVITY #35

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1 period

Capsule Activity Description: Students role-play a situation in which a friend who has been drinking excessively is about to drive.

Goal:

To understand the feelings of someone who has been drinking and who gets advice from sober people.

Concepts Treated:

- Many drivers become offended when their ability to drive is questioned.
- In many situations there is a conflict between one's duty to oneself and one's duty to a friend.
- A drinking driver may hurt not only himself but many other people including his friends.

ACTIVITY

Students role-play a confrontation between friends, one of whom has been drinking excessively and is about to drive. Sample scenarios follow the activity.

At the end of each role-play, participants read their role profiles to the class and discuss the feelings they experienced while acting. Other students discuss how they might have responded to the situation. The teacher adds his or her own comments.

Evaluation Method:

Students write a television commercial urging "Don't drink and drive!"

SAMPLE ROLE PROFILES

Husband and Wife

Friend

Your best friend is pretty drunk and is ready to drive his wife home. You feel he's in no condition to drive, and even if he doesn't hurt himself, his wife, or someone else, he's liable to get arrested and lose his license. But you know you're going to have a tough time convincing him not to drive when he's with his wife. She'd like him not to drive but is afraid to say so. She doesn't have a driver's license, either. In addition, he has no money with him to take a taxi and there are no buses around this neighborhood.

Wife

Your husband has been drinking quite a bit at this party, something he usually doesn't do. You've kidded him about it, trying to get him to slow down, but he won't take the hint. Now he's ready to drive you home and you'd rather he didn't drive but you're afraid to tell him not to, especially since you don't know how to drive.

Drinking driver

You are with your wife at a party and have had quite a bit to drink, but you're not too drunk to drive home. Why, she doesn't even have a license to drive. Besides, you live only four miles away and the roads should be pretty empty at 11 p.m.

Friends

Friend

You and four friends have been drinking at a bar. Three of them start walking home, but the one who owns the car and is really drunk stays to drink a little longer with you. He (or she) is going to insist on driving you home because he won't admit he can't hold his liquor and, anyway, seems to get his kicks out of doing risky things. You know that if you refuse to go with him he will still try to drive home. Now that it's 11:00 p.m. he starts to stagger up to leave.

Drinking driver

You've been drinking in a bar with four friends. Three have started walking home and now you're almost ready to give the fourth one a ride home. You've had quite a bit to drink, but it's a challenge, you feel, to try to drive when you're drunk. You start to get up to go home, and you'll insist on giving your friend a lift--it's more fun driving with someone when you're drunk. Your friend is usually a sissy and you want to help him (or her) get over that.

MINI-UNIT 10

BUYING AND MAINTAINING A CAR

For many people, safety is a secondary consideration when they buy a car, something that they think about grudgingly, if at all. In recent years, the United States has become more safety conscious and the government, through such agencies as the National Highway Traffic Safety Administration, has begun to mandate certain safety features for cars. But the citizenry at large still seems to feel that "accidents happen to other people" and that safety is nobody's business but their own.

This mini-unit points out to students that safety is their concern and that it is one of several considerations they should have in mind as they try to decide what kind of car to buy. Some of the purchaser's money should be spent for safety as well as for such other features as looks, speed, and comfort.

Having once purchased a car, the owner should also be aware that he needs to spend some money on maintaining a car in order to keep it running smoothly and safely. A car that is apt to break down is not only inconvenient, it is also unsafe.

Major concepts treated are

- Basic safety items on a car are brakes, tires, windshield wipers, headlights and brake lights, turn signals, side mirrors, and safety belts.
- A used car requires more attention to safety than a new one.
- Shopping for a safe car requires thought and planning.
- Cars are sold through the use of a variety of sales appeals.
- Maintaining a car properly is a definite contribution to safety.

MINI-UNIT 10 LESSON PLAN

Buying and maintaining a car

Activity #	*Activities*	*Class Time*
36	DESCRIPTION: Students discuss the safety considerations to keep in mind when buying a new or used automobile. GOAL: To know which features make a car safer and which merely add convenience.	½-1 period
37	DESCRIPTION: Students role-play purchasers "buying" a car. GOAL: To learn the skills and behaviors of being a careful shopper.	1-2 periods
38	DESCRIPTION: Students analyze automobile advertisements and discuss why safety considerations are not usually included in the sales pitch. GOAL: To discover what the sellers of automobiles consider to be the primary motives of Americans for buying cars.	1 period
39	DESCRIPTION: Students question automobile mechanics concerning regular maintenance that car owners can perform or should have garages perform in order to keep their cars running safely. GOAL: To know when cars need maintenance services, which services an owner can perform, and which services require an experienced mechanic.	2-3 periods

Total Class Time: 4½-7 periods.

ACTIVITY #36

Mini-unit Topic: Buying and Maintaining a Car **Approximate Class Time:** ½-1 period

Capsule Activity Description: Students discuss the safety considerations to keep in mind when buying a new or used automobile.

Goal:

To know which features make a car safer and which merely add convenience.

Concepts Treated:

- Basic safety items on a car are brakes, tires, windshield wipers, headlights and brake lights, turn signals, side mirrors, and safety belts.
- A used car requires more attention to safety aspects than a new one.
- Some optional equipment contributes to safety, but some does not.
- The National Highway Traffic Safety Administration can help identify automobile models that have been recalled by manufacturers because they have safety-related defects that require repairs.

ACTIVITY

The class breaks into small groups and each group is instructed to develop a list of considerations the purchaser of an automobile should have in mind in order to buy a safe car. After developing lists, groups present them to the class and a master list is prepared. Considerations which are peculiar to the purchase of second-hand cars should be singled out with an asterisk or other identifying mark. You can supplement the students' suggestions with the following safety considerations:

- *Size and weight:* Given similar designs, heavier cars may provide greater protection to occupants in car-to-car crashes than do lighter cars. It is expected that the average weight of automobiles will decline substantially in future years, as a result of national efforts to conserve energy. This change will make weight a less relevant safety factor.

- *Optional equipment:* Examples of some items that may contribute to safe driving are high-quality tires: radial, bias-ply, and bias-belted; day/night rear-view mirrors; rear window defrosters or defoggers; and remote-control driver's side outside mirrors.

- *Visibility:* Are there "blind spots" which make it difficult for the driver to see the road, out the back window, or the dashboard, because of the way the automobile is built?

- *Brakes and tires:* If the car is used, are these in prime condition, or are repairs or replacements needed?

- *Defects:* For used cars, a purchaser should check to learn whether the model she or he is considering buying has been recalled by the manufacturer because of a safety-related defect--*and* whether the particular car itself has, in fact, been taken to the dealer for the required repairs. (Forty percent of all recalled cars are not taken back to a dealer for repairs.) The procedure for checking is simple: Telephone (at no charge) the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA), which can tell you immediately whether the model has ever been recalled because of a safety-related defect. If it has, NHTSA will send you, by return mail, a postal form on which you enter your name, address, and vehicle identification number. Send the form to the appropriate manufacturer, who will then notify you whether the particular car you are considering has been properly repaired to eliminate the safety-related defect. (To call NHTSA, dial its toll-free Hotline number: (800) 424-9393. NHTSA's mail address is Office of Consumer Services, NHTSA, Washington, D.C. 20590.)

- *Owner's manual:* Make sure it is provided with a used car.

- *Safety record:* Research the record of this make and model in past years.

- *Prior history* (for used cars): Ask for the record of past safety inspections, repairs, and accidents.

- *Safety belts:* Check to see that car has three-point safety belts and that they can be adjusted to fit comfortably.

- *Brakes:* Check consumer information sources to learn which combination of options is best for stopping distance (e.g., disc brake/drum brake/power-assisted brake). Note: Power brakes do not assure better braking in terms of stopping distance or controllability than do conventional brakes. On the contrary, when there is a failure in the power boost system, power brakes require much greater foot pressure to use than do conventional brakes.

- *Odometer:* If the car is a used one, ask for a written mileage disclosure statement. The Federal odometer law (part of the Motor

Vehicle Information and Cost Savings Act) requires that the seller must provide the buyer with a written statement of the registered mileage. For complete details on this requirement, write to NHTSA (at the above address) for a free copy of the fact sheet "Consumer Protection Under the New Antitampering Odometer Law."

After compiling a complete list, class breaks into small groups again and discusses the following questions:

1. How can purchasers determine how safe the cars are which they are considering buying? (E.g., read appropriate literature; test drive the vehicle, testing for brakes, steering and visibility in particular, and fit of safety belts; take car to an independent mechanic for inspection.)

2. What sacrifices might a purchaser have to make in order to buy the safest possible car? (E.g., additional costs, appearance, speed, power.)

3. Few people consider safety when buying a car. Why not? Is it possible to motivate people to include safety considerations as one of their criteria in selecting what car to buy? How?

After discussions, groups present results to class and comment on each other's presentations.

Evaluation Method:

Students select an advertisement, from today's newspaper, for a new or used automobile. In writing or orally they explain whether they would purchase it, in terms of safety considerations alone.

ACTIVITY #37

Mini-unit Topic: Buying and Maintaining a Car

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students role-play purchasers "buying" cars.

Goal:
To learn the skills and behaviors of being a careful shopper.

Concepts Treated:

- Shopping for a safe car requires thought and planning.
- Information is often available if you ask for it.
- Both purchasers and sellers behave in ways that are oriented at goals.
- The seller has certain obligations toward the buyer.
- The buyer needs to be clear about what he wants.

ACTIVITY

Students take the parts of car purchasers and car sellers (either salespeople or private sellers) and role-play buying a car. Sample role profiles are provided on the following pages.

After each role-play, participants read their role profiles to the class and discuss the feelings they had while role-playing--were they angry (at the seller for being evasive)? embarrassed (at being so aggressive with the seller)? defensive (at being questioned so closely by the purchaser)? afraid (of buying an unsafe car or of losing a sale to a customer)? Nonparticipants discuss what they would have done had they been involved. The class identifies the techniques used by the purchaser to obtain information and the methods, if any, used by the sellers to withhold information or answer dishonestly. The class lists the specific information each purchaser requested about safety and considers whether additional information should have been sought.

After one or more role-plays, the class should be encouraged to write role profiles to act out.

Evaluation Method:

Students write their own scenario and role profiles.

Variation and Supplementary Activity:

Activity can be a class or small group discussion.

Sample Role Profiles

Private Sale

Purchaser

You are in the market for a car. You need it to get to your job and you also think it would help your social life if you had one. You know what kind of car and model you want, but you can't afford a new one with the amount of money you have saved and the income from your job. You have seen a newspaper ad in which someone advertises the very kind of car you are looking for for a pretty good price. The ad doesn't say what condition the car is in. You hope it is a safe car, because if you buy it, you won't have any money left over to pay for repairs for at least four months.

Seller

You are selling your old car. You have advertised it in the newspaper and have a potential customer. You know that the brake linings on the car are pretty well worn out and probably are good only for another one or two thousand miles before needing replacement.

Buying from a Dealer

Purchaser

You have always wanted to buy an attractive new car, but until now you never could afford one, because you were still in college. But now you have been out of college for a year and have saved a couple of thousand dollars from your job and you have a $500 present your grandfather gave you when you were graduated. You'd like to get a car now, because you'll soon be getting married. You'll need a new car then, and most of your extra money will be going for new furniture and stuff like that. You have just walked into Abe's Auto Sales showroom and been greeted by a salesperson. What do you say about the kind of car you want and what options you will consider?

Salesperson

You are a salesperson in Abe's Auto Sales Store. You get a commission on every car you sell--and, if you sell enough, a special bonus at the end of the year. But you've found you have to be careful these days. Car buyers aren't as careless as they used to be about the cars they buy. They're concerned about economy, guarantees, and safety. In fact, here comes a serious looking young prospect right now. You wonder what kind of car he (she) wants and whether you'll be able to sell him (her) an expensive model with lots of extras.

Buying from a Dealer

Purchaser

You are in the market for another second-hand car. The one you have now needs a new muffler, a ring job, and three new tires. But you know the last time you bought a second-hand car--in fact, the car you're now driving--it almost got you killed because it was in such poor shape. This time you're determined to get a car that won't get you into an accident the first month you've owned it. You have just walked into Susan's Second-hand Car Lot to look around for a car you can afford. A salesperson is coming over to you to see what you want. What do you say you are looking for in a car?

Salesperson

You work in Susan's Second-hand Car Lot as a salesperson. You get a commission on every car you sell, so naturally you like to sell not only as many cars as possible but ones that are as expensive as possible, too. You have just spotted someone looking over the cars in the lot and walk over to see if you can sell one more car this week.

Additional role profiles can be created by varying the type of car the purchaser wants (e.g., sportscar, stationwagon, camper); special safety concerns (e.g., for maximum visibility, for carrying young children, for pulling a trailer); the amount of money the purchaser can afford to spend; and the extent to which the purchaser is also concerned about other aspects of a new automobile that may conflict with safety considerations (e.g., speed, power, style, cost).

ACTIVITY #38

Mini-unit Topic: Buying and Maintaining a Car

Approximate Class Time: 1 period

Capsule Activity Description: Students analyze automobile advertisements and discuss why safety considerations are not usually included in the sales pitch.

Goal:

To discover what the sellers of automobiles consider to be the primary motives of Americans for buying cars.

Concepts Treated:

- Cars are sold through the use of a variety of different sales appeals.
- Cars are bought for a variety of reasons.
- All features of a car, including safety features, cost money.
- A safe car can also be powerful, good-looking, fast, and fun to drive.

ACTIVITY

Prior to the activity, students are instructed to bring to class different automobile advertisements--including, if possible, tape recordings of television and radio advertisements, as well as magazine and newspaper advertisements. Class then breaks into small groups to analyze the advertisements. Each group examines the same three to six advertisements, answering the following questions:

1. What are the major methods by which the companies are seeking to persuade the public to buy their cars? (style? economy? power? sex appeal? safety?)
2. How important are safety features as an inducement? What specific safety "pitches" do the ads make?
3. Do safety features take away from other features or can they be combined with others?

4. If safety is not a major method by which automobile companies try to persuade the public to buy their cars, why is so little stress placed on this aspect of driving? Is there little basis for competition between car companies in terms of safety features? Is the public not motivated to choose cars on the basis of safety considerations? Do automobile manufacturers want to avoid competing with one another to provide expensive safety features?

5. If car companies competed to sell cars primarily on the basis of safety claims, would they sell as many cars? If one company tried to sell a car on the basis of the superior safety features and another tried to sell a basically similar car touting its speed, styling, or economy, which car would the public be more likely to buy? Why?

Small groups present their conclusions to the class and check for similarities and differences. General discussion follows on why the public seems more concerned about styling, power, and economy in their cars than safety features. Given these priorities, can anything be done to change the criteria Americans use for deciding what automobiles to buy?

Evaluation Method:

Students write their own advertisements for a car in which the stress is on that model's superior safety features.

Variations and Supplementary Activities:

Students in small groups develop their own advertisements for automobiles and compete on the basis of safety features. Each group can develop a different advertisement, and students from another class can "shop" among the different groups to "purchase" the cars which appeal to them the most.

Students can read Ralph Nader's *Unsafe at Any Speed* and evaluate his claim that the automobile industry has engaged in collusion to avoid competing on the basis of safety features.

Students can analyze the American's alleged love affair with the automobile and discuss whether Americans have irrational or nonrational reasons for buying and driving certain types of cars.

ACTIVITY #39

Mini-unit Topic: Buying and Maintaining a Car

Approximate Class Time: 2-3 periods, plus out-of-class time

Capsule Activity Description: Students question automobile mechanics concerning regular maintenance that car owners can perform or should have garages perform in order to keep their cars running safely.

Goal:

To know when cars need maintenance services, which services an owner can perform, and which services require an experienced mechanic.

Concepts Treated:

- Maintaining a car properly is a definite contribution to safety.
- Some maintenance tasks can be performed by the owner or operator.
- Some maintenance tasks must be performed by an experienced mechanic with the proper tools.
- Proper maintenance prevents breakdowns and can save money.

ACTIVITY

Students develop a questionnaire for car mechanics to learn what maintenance car owners themselves should perform to keep their cars running safely and when cars should be taken to mechanics for maintenance and repairs to ensure safe driving.

The class then breaks into small groups and each group develops its own poll. The groups can then either administer their own questionnaires, develop as a class a master questionnaire for every group to use, or use the sample poll provided at the end of this activity. Each group also identifies mechanics in the community whom the students can interview.

After administering the questionnaire, students compare results and develop a master list of maintenance tasks related to safe driving and divide them into two categories: tasks the average owner can do and tasks for which a trained mechanic is necessary. Students discuss whether and how people can be motivated to maintain their cars regularly.

A committee is appointed to research and report back to the class on these questions: What are your state's requirements for automobile inspection? How often must cars be inspected? What parts are inspected? What tasks must automobiles perform during inspection? The class compares the state's requirements with their own master list of maintenance tasks related to safe driving.

Evaluation Method:

Students write a one-page flyer, to be handed out at state inspection stations, entitled: "What to do so your car can pass inspection year after year."

Variations and Supplementary Activities:

Using the chart on the next page as a guide, students develop a test to administer to other students about maintenance and safety. One test might simply consist of listing some or all of the items in the left-hand column (repair needed) and ask the person who takes the test what the risk is if the repair is not made.

Students can invite a mechanic to class to explain the relationship between maintenance and safety and what maintenance tasks should be performed to keep cars running safely.

Students research and report back to the class on how regular maintenance can save fuel.

AUTOMOBILE MAINTENANCE AND SAFETY CHART

Repair Needed	*Risks Involved*	*Further Explanation*
Tires with little or no tread	Skidding, especially in wet weather Blow-outs	Should be ¼ inch of tread on all parts of each tire, including spare.
Inoperative horn	Inability to signal other cars	
Noisy muffler	Carbon monoxide poisoning Difficulty hearing other vehicles	
Broken windshield wiper or poorly operating wiper	Impaired visibility	Combination of rain, darkness, and faulty windshield wipers is particularly dangerous.
Improper tire pressure	Skidding, especially in wet weather Blow-outs, especially overinflated tires in hot weather at high speeds Uneven braking	Purchase of pocket tire air pressure gauge can be well worthwhile in terms of convenience. Keep it in glove compartment.
Faulty heater	Inability to melt snow on windshield Carbon monoxide poisoning Distraction of being too cold to drive safely	Particularly in winter, a faulty heater is dangerous when windows are kept closed.
Rusted tailpipe	Carbon monoxide poisoning	May require getting down on the ground and looking underneath the car.
Broken headlight or tail light	Poor visibility at night Inability to signal other cars	Periodically have someone watch while you test lights or get out and walk around car yourself.
Broken directional signal	Inability to signal other cars	Same as above. Use hand signals in good weather.
Unbalanced wheel alignment	Difficulty in steering	Can detect this by oversteering tendency when you drive.
Low brake fluid	Brake failure	Ask mechanic to check for this or read owner's manual and do it yourself.
Inoperative or poor parking brake	Parked car on an incline "running away"	

Sample Questionnaire of Mechanics on Car Maintenance and Automobile Safety

1. What regular maintenance tasks are necessary to keep a car running safely--for example, replacing tires which have no tread left?

2. What kinds of accidents take place because regular maintenance work was not performed on a car?

3. Which maintenance tasks related to safety can the average car owner perform him- or herself?

4. How often or when should each of the maintenance tasks you listed in Question 1 be performed?

5. In your experience, do car owners tend to have this kind of maintenance work performed regularly or do they wait until something happens which forces them to have it done?

6. Why do you think drivers who do not regularly keep their car in safe running condition fail to do so?

MINI-UNIT 11

WALKING AND DRIVING

Even more people walk than drive cars, for every automobile driver or passenger is also a pedestrian. Thus it is very important to be a safe pedestrian in this automotive society.

This is especially true of young children. They do a lot of walking (or running and playing in the street), on their way to and from school and at other times. Because they are young and do not know how to drive cars themselves, many young children are unaware of how dangerous a car can be to them. This mini-unit concentrates on the pedestrian safety of young children, from the driver's point of view. What can drivers expect from young children who are playing in front of their houses or who are on their way to school? What can drivers do to protect themselves from being involved in an accident in which a child is injured or killed? Many child/car accidents are the fault of the child, but that is small comfort to the driver whose car has hit a youngster. This mini-unit tries to alert drivers that they have to exercise extra caution when there are children around the streets.

Major concepts treated include

- Young children are involved in a very high percentage of pedestrian accidents.
- Many child pedestrian accidents are caused by the child himself.
- Some hazards are peculiar to intersections, some to midblock locations.

MINI-UNIT 11 LESSON PLAN

Walking and driving

Activity #	*Activities*	*Class Time*
40	DESCRIPTION: Class discusses the pedestrian dangers young children face. GOAL: To understand the special dangers to which young children are exposed as they walk to and from school or play in and around streets.	2-3 periods
41 Spirit Master #7	DESCRIPTION: Students identify pedestrian hazards and formulate appropriate community countermeasures to enhance pedestrian safety. GOAL: To know what pedestrian hazards are and how to cope with them.	1½-2 periods

Total Class Time: 3½-5 periods.

ACTIVITY #40

Mini-unit Topic: Walking and Driving   Approximate Class Time: 2-3 periods

Capsule Activity Description: Class discusses the pedestrian dangers young children face.

Goal:

To understand the special dangers to which young children are exposed as they walk to and from school or play in and around streets.

Concepts Treated:

- Young children are involved in a very high percentage of pedestrian accidents.
- Many child/pedestrian accidents are caused by the child himself.
- Safety education for young children is successful, since the child/pedestrian accident rate decreases after children begin to attend school.

ACTIVITY

Using the attached material, discuss the problems young children have as pedestrians and the nature of the accidents children are most often involved in.

Discuss the responsibilities of various persons in preventing accidents to young children while they are walking or playing:

- Parents
- Primary teacher
- Average driver
- Law enforcement officer
- School crossing guards (both children and adults)

- Older brothers and sisters

What should each of these persons do? What can he or she do?

Have a parent (if possible, one of the students in the class who is also a parent) explain how he or she is teaching or taught his or her child to be a good and safe pedestrian. The following points should be covered:

1. Reasons for teaching child to be a good pedestrian
2. Age of child at beginning of effort
3. How long it took
4. Fears or concerns of parent before and during effort
5. Hazards within community for pedestrian training
6. What was done to teach child to be safe pedestrian
7. Success of effort

Have a driver explain what precautions he or she takes in order to minimize injuring walking or playing children. Some of the points to touch on would be these:

- Drive slowly through residential areas.
- Be alert for "dart-out"--children rushing into the street in the middle of a block between parked cars.
- Be aware that if you see one child, another one, unseen, may be nearby.
- Be particularly alert around ice cream vendors and similar attractions.
- Pay attention to "School Bus Stop" signs.

At the end of the discussion, have the class draw up four sets of guidelines:

- For *parents*, to teach pedestrian safety to their children, especially when they are playing near their homes
- For *teacher*, to teach pedestrian safety to children, especially when they are on their way to and from school
- For *children*
- For *drivers*

Evaluation Method:

Students observe children in their neighborhood for a short period of time (5-10 minutes) and report back on what dangerous pedestrian behaviors they noticed and what could be done about them.

Overview of Child Pedestrian Accident Picture*

Studies of the pedestrian accident experience of children in various regions of our country indicate that basically there exists a pattern of child pedestrian accidents common to all areas. This pattern can best be illustrated by discussing the circumstances surrounding child pedestrian accidents as revealed by accident studies.

Dr. Stina Sandeis, a leading Swedish psychologist, has reported in her study, "Young Children in Traffic," that young children are especially hampered in traffic because they have not yet developed the necessary skills for safe walking in traffic. These skills include the ability to see out of the corners of the eyes, to localize sounds, and to understand road signs or comprehend traffic terms.

Younger, inexperienced children of three and four years of age begin to show increased problems in pedestrian safety. The seriousness of the pedestrian accident problem continues and intensifies when youngsters of primary grade age are sent off to school and are independent in traffic for the first time in their lives. The effects of safety education instruction in school, the protection provided by school safety patrols and other traffic safety aids, plus more experience gained through independent movement in traffic are key factors resulting in a steady improvement of the pedestrian safety record for youngsters age 5 to 14.

Unsafe Acts by Children Chief Cause of Young Pedestrian Accidents

Accidents involving children cause an emotional impact in most communities and result in many varied demands for more vigorous enforcement of speed regulations or blocking off of certain streets to vehicular traffic. Yet, the fact remains that nearly 80 percent of all child pedestrian accidents were precipitated by unsafe or illegal actions on the part of the children themselves.

In the majority of cases, there was very little the drivers could do to avoid being involved in child pedestrian accidents. This information is not presented as an alibi for careless drivers; the facts clearly speak for themselves.

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*_The Young Pedestrian_, Pedestrian Safety Program/Trips, No. 3 (American Automobile Association, Traffic Engineering Department: Washington, D.C., 1972), pages 4-9.

Boys More Accident Prone than Girls

Regardless of age, boys are involved in about seven out of every ten child pedestrian accidents. The reasons for this bad experience for boys may be related to our cultural values. Parents expect boys to be more daring and are disappointed if they are not aggressive and adventuresome. Boys have more freedom to engage in activities that expose them more to traffic situations. This attitude, good or bad, unquestionably influences the high pedestrian accident experience of boys.

Children, when observed traveling back and forth to school, exhibit striking contrasts in their walking attitudes: boys run and jostle; girls walk and talk, usually in groups. Girls are inherently more cautious, less aggressive and adventuresome--another attitude most acceptable for girls in our society.

To-and-from-School Safety Demands Community Attention

Based on the Special Study of School-child Pedestrian Accidents reported by the American Automobile Association from data obtained from communities across the country, each year some 500 children are killed and 11,000 are injured in pedestrian accidents as they walk to or from school.

However, the accident record for children en route to and from school has improved greatly in spite of the increasing numbers of vehicles on the highways, the increasing numbers of children going to school, and the increasing complexity of our traffic conditions around the vicinity of schools.

Since 1935, the traffic death rate for youngsters 5 to 14 years of age has been cut in half, while the rate for all other age groups has doubled. The outstanding work of school safety patrols and adult crossing guards, plus improved school area traffic controls, have played an important role in achieving this fine progress.

Non-school Hours Have Highest Accident Frequency

About 90 percent of all child pedestrian accidents occur at times other than when children are on their way to and from school. The greatest period of danger for children in traffic is from 3 to 7 p.m., mostly during daylight hours.

Young Pedestrians Most Often Struck Near Home

Most pedestrian accidents involving children occur on residential streets within a short distance of the victims' homes. The Sandeis study points out that over 82 percent of the children studied played within 100 yards of their front doors. More often than not, these accidents occur as the children run out into the roadway and into the path of a moving vehicle. The drivers involved in such accidents are generally local residents who are familiar with the roadways.

According to a recent study released by the Department of Transportation, "Pedestrian Safety--the Identification of Precipitating Factors and Possible Countermeasures," 31 percent of all pedestrian accidents are classified as "dart-out." That is, the victim suddenly appeared in the street at a nonintersection. In contrast to other pedestrians, the young pedestrian is most often struck while crossing between intersections rather than at intersections.

Parked Cars--Hazardous for Youngsters

Many children are struck as they enter the roadway from between parked cars. Very young children are often involved in accidents as they play around parked cars in driveways and alleyways.

Playing in the Roadway Leads to Accidents

With the tremendous increase in motor vehicles on our streets and highways, the dangers for children playing in roadways are growing more serious every day. Youngsters struck while riding on wagons, sleds, scooters, roller skates, or tricycles are classified as pedestrian accidents. However, accidents involving children on bicycles with wheels over 14 inches in diameter are not classified as pedestrian accidents. Hitching onto vehicles is another dangerous practice that has resulted in youngsters being seriously injured.

Street Vendors Increase Hazards for Children

Many communities have become increasingly alarmed at the potential accident situation created as children are enticed into the roadway by street vendors selling ice cream and other treats. The previously mentioned Department of Transportation study points out that ice cream vendors are major factors in attracting children into the street. In some areas, ordinances have been passed prohibiting such street selling.

Urban Freeways Are No Place for Youngsters

With the rapid growth in development of urban freeways and beltways, more and more accidents occur involving youngsters crossing or walking along these high-speed roadways. Most communities have already enacted ordinances prohibiting pedestrians from walking across or along these roadways.

ACTIVITY #41

Mini-unit Topic: Walking and Driving

Approximate Class Time: 1½-2 periods, plus out-of-class time

Capsule Activity Description: Students identify pedestrian hazards and formulate appropriate community countermeasures to enhance pedestrian safety.

Goal:

To know what pedestrian hazards are and how to cope with them.

Concepts Treated:

- Being a pedestrian includes coping with hazards.
- Some hazards are peculiar to intersections, some to mid-block locations.
- Some pedestrian hazards are related to other activities, such as making purchases from a street vendor.
- Some age groups present a higher pedestrian risk than others.

ACTIVITY

Write this statement on the chalkboard:

> In 1973, approximately 400,000 pedestrians were involved in accidents with motor vehicles. About 10,000 of the accidents resulted in pedestrian fatalities, with 64 percent of these fatalities occurring in urban areas.

As a class discuss some or all of the following issues:

- Do you ever think of yourself as a pedestrian? What responsibilities do you have as a pedestrian?

- Do you ever worry about your safety as a pedestrian? Why or why not?
- Does a pedestrian have any kind of protection from harm? What protects a pedestrian best?

Brainstorm for dangerous pedestrian practices that students or others engage in. List them on the chalkboard. Some practices that might be mentioned follow:

- Darting into street without looking
- Not crossing at crosswalk or intersection
- Standing in street rather than on sidewalk while waiting to cross street
- Not paying attention while walking (e.g., talking to a friend, reading newspaper)
- Walking at night wearing dark clothing
- Running rather than walking across street
- Getting caught in middle of street when traffic starts up
- Being upset, drunk, on drugs while walking

Using the material attached, relate those practices mentioned by the students to the eight most frequently occurring pedestrian accidents.

To find a solution or solutions for improving pedestrian safety, students first observe pedestrian habits and practices at various points in the community. Break the class into pairs and pass out the first table, which outlines the characteristics of each type of accident. Using this table and the list on the chalkboard as guides, students make up an observations sheet or adapt the one provided as Spirit Master #7.

Working together, students choose a location from which to observe pedestrian movement at different times over a period of a few days. When the information has been gathered, students determine what precautions pedestrians should be taught or alerted to, to ensure their safety, and what the community can do to further the public's safety while walking.

Students present their findings and conclusions to the class in a form similar to that in the second table, which are then compared to the pedestrian countermeasures and expected outcomes of the table. The countermeasures are then assessed, and the best ones for the local community are chosen and outlined.

Evaluation Method:

Students make up a pedestrian safety brochure for their community.

Variations and Additional Activities:

Students pick a particular age group or population to observe and report on.

Students can focus on the dangers of playing in railway yards and around railroad crossings.

Students research the existence of antijaywalking laws and if they are enforced.

Pedestrian Hazards*

Eight frequently reported types of accidents account for over 55 percent of the pedestrian accidents studied. A brief description of the eight types of pedestrian accidents follows:

Dart-out (First Half). A pedestrian, not in an intersection crosswalk, appears suddenly from the roadside. His quick appearance and short-time exposure to the driver are the critical factors. The pedestrian often may be running, and parked cars often obstruct vision, but neither need be present if the basic condition of sudden appearance to the driver's view is met. The prime example of the dart-out is a school-age child running out from between parked cars on his own block, in a residential area in the center city in the afternoon after school. He heads straight across the relatively narrow street, looking where he is going and is struck less than halfway across. The driver, traveling at a normal rate of speed, did not have enough time to stop after detecting the child.

Dart-out (Second Half). This is the same as the dart-out described for the first half above, except that the pedestrian covers half of a normal crossing before being struck. The distinction was made because of the possible differences in the opportunities or problems relative to driver detection and recognition of danger if the roadway is clear. However, this type was assigned even if traffic obscured the

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*Wallace G. Berge, *Urban Pedestrian Accident Countermeasures Experimental Evaluation,* Volume 1, Behavioral Evaluation Studies (prepared for National Highway Traffic Safety Administration and Federal Highway Administration, U.S. Department of Transportation: Washington, D.C., February, 1975), page 1-1.

driver's vision. It may be used even if the pedestrian crosses a medium-size median strip of a boulevard.

Intersection Dash. This category covers cases similar to dart-outs with regard to pedestrian exposure to view, but the incident occurs in or near a marked or unmarked crosswalk at an intersection. Cases are included if the pedestrian is running across the intersection even though his exposure to possible driver view is not extremely short. (His speed will, in effect, limit his actual exposure to the driver.)

Vehicle Turn/Merge with Attention Conflict. The driver is turning into or merging with traffic; the situation is such that he attends to auto traffic in one direction and hits the pedestrian who is in a different direction from his attention. A critical feature is that the attention conflict is built into the situation. Usually the driver directs his attention in a given direction to determine an acceptable gap into which he will enter.

Pedestrian Strikes Vehicle. This classification covers crashes *not* covered by other clear types (e.g., dart-out), in which it has been determined that the pedestrian ran or walked into the car.

Multiple Threat. The pedestrian is struck by car *x* after other cars blocking the vision of car *x* stopped in other lanes going in same direction and avoided hitting the pedestrian. For example, cars in lanes one and two stop and permit the pedestrian to cross; car *x* in lane three going in the same direction hits the pedestrian as he steps out in front of the car in lane two. This classification is not used if the striking vehicle is going in the opposite direction from the stopping cars. (In that situation, the stopping cars would not block the driver's vision.)

Bus Stop Related. This type includes cases in which the location or design of the stop appears to be a major factor in the causation; e.g., the pedestrian crosses in front of the bus standing at a stop on the corner, and the bus blocks the view of cars. It does not include those cases that may be considered as exiting from a vehicle, nor does it include cases in which the stop is only an attraction or distraction.

Vendor-Ice Cream Truck. The pedestrian is struck going to or from a vendor in a vehicle on the street. This is usually similar to a dart-out, with ice cream trucks being the most frequent attraction. This specific classification was given precedence over dart-out when assigning cases to types.

The following table further defines these accident types in terms of some of their locational (e.g., block location, environmental settings) and behavioral (e.g., running into roadway, between parked cars) characteristics.

PEDESTRIAN ACCIDENT DESCRIPTION[1]

		Characteristics						
	Accident Type	*% of Ped. Accidents*	*% That Are Fatal*	*Time of Day*	*Ped. Age*	*Block Location*	*Area*	*Accident-Related Behavior*
1.	Dart-out First Half	24.1	8.3	Day (70.5)[2]	5-9 (52.5)	Nonintersection (90.7)	Residential (63.4)	Running into the roadway Failure to look for traffic Entry between parked vehicles
2.	Dart-out Second Half	8.8	10.4	Day (71.7)	5-9 (49.7)	Nonintersection (74.1)	Commercial (35.4)	Running into second half of roadway Midblock crossing Entering between parked vehicles
3.	Intersection Dash	8.4	6.7	Day (76.8)	5-9 (39.0)	Intersection (96.9)	Commercial (48.5)	Failure to look for traffic Crossing against the light Running into the roadway
4.	Vehicle Turn/Merge with Attention Conflict	6.4	8.8	Day (70.9)	All	Intersection (85.5)	Commercial (73.7)	Vehicle turning in proximity of pedestrians Failure to look for traffic Failure to detect pedestrian
5.	Pedestrian Strikes Vehicle	4.0	2.3	Day (81.6)	5-9 (34.2)	Intersection (57.6)	Commercial (40.7)	Running into the roadway Failure to look for traffic Entry between parked vehicles
6.	Multiple Threat Situation	3.2	5.8	Day (83.6)	10-14 (20.9)	Intersection (70.7)	Commercial (65.2)	Entry from in front of standing vehicle Small separation between stopped vehicle & pedestrian Running in roadway Failure to detect pedestrian
7.	Bus Stop Related	2.6	17.9	Day (80.4)	10-14 (17.0)	Intersection (81.1)	Commercial (61.8)	Entry from in front of stopped bus Failure to detect pedestrian
8.	Vendor-Ice Cream Truck	1.5	12.4	Day (87.0)	5-9 (69.0)	Nonintersection (31.8)	Residential (78.3)	Running into the roadway Failure to look for traffic Excessive vehicle speed Failure of driver to detect potential threat

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[1] Data based on Snyder and Knoblauch (1970).

[2] Percent so classified.

SUMMARY OF COUNTERMEASURES FOR PEDESTRIAN SAFETY

Countermeasure	*Utility*	*Expected/Actual Results*
Segregation of traffic by type; isolation of pedestrian from traffic	Roadway differentiation by type of traffic; separation of pedestrian movement and vehicles; separation of pedestrians by footpaths, underpasses, escalator-type overpasses	Substantial savings in accidents, injuries, property damage and lives; reduction in cost of time loss imposed on vehicular traffic by pedestrians
Provision for reduced speed limits in school areas and adult crossing guards	Installation of warning signs, flashing lights, reduction of speed limit in school area	Increased protection of school-age pedestrians in school zones
Use of reflective and retro-reflective materials for greater pedestrian visibility	Brighter reflective characteristic than white material; ease in application to clothing, and removal when not required	Increased visibility of pedestrians after dark, with commensurate reduction of casualties
Public education on pedestrian rights and responsibilities	Develop responsible reactions to traffic danger	Formulation of pedestrian safety programs for children and adults
Identification of drinking pedestrians and the removal of unqualified or medically impaired drivers	Control of accidents involving problem drinkers and removal of certain drivers from the road	Minimize accidents resulting from alcohol and human failure
Creation of safe play areas in high-accident, high-density areas	Provision of adequate, safe play areas away from traffic	Reduction of accidents to children
Crosswalk illumination and use of abrasive at crossing site	Illumination providing no glare in the motorist's field of vision and faster stopping capability than smooth surfaces	Reduction in vehicle-pedestrian accident rate
Redesign of streets, creation of pedestrian preserves and paths, prohibition of vehicular traffic from certain streets during specific daylight hours.	Accommodates movement of growing populations while prescribing transport and safety features	Improvement in public transport; increased safety for pedestrians
Prohibition of on-street parking; parking restrictions; barriers; and improvement of traffic signal cycles	Field of view of driver and pedestrian greatly improved; removal of physical obstructions; prevention of pedestrian passage between parked vehicles; and enabling pedestrians to cross intersections with greater safety	Increased safety for pedestrians

From *A New Look at Pedestrian Safety*. U.S. Department of Transportation, National Highway Traffic Safety Administration, November, 1975.

MINI-UNIT 12

LEARNING ABOUT EMERGENCY VEHICLES

Most of us hope never to have to use an emergency vehicle. We do not plan to be sick or to be involved in a serious accident, and so we do not prepare for summoning emergency vehicles. In this mini-unit we discuss what emergency services are generally available and what vehicles each kind of service employs. We also invite the students to pay particular attention to their own community and to try to evaluate what kind of emergency services should be available and whether their community can afford them. Emergency vehicles are costly and are used only sporadically--but when they are needed there is no substitute for them. Their presence and availability can mean the difference between life and death.

Among the concepts treated are

- Different kinds of emergencies call for different kinds of services.
- In the typical community, only some emergency vehicle needs can be met.
- Emergency needs priorities must be created.

MINI-UNIT 12 LESSON PLAN

Learning about emergency vehicles

Activity #	*Activities*	*Class Time*
42	DESCRIPTION: Class discusses the nature of emergency vehicles. GOAL: To know different kinds of emergency vehicles and the special duties each performs.	½-1 period
43	DESCRIPTION: Students evaluate the emergency vehicle needs of their community and develop a plan to provide those vehicles and services that are lacking. GOAL: To understand the needs of the community (in terms of emergency services) and how to provide for them effectively.	½-2 periods

Total Class Time: 1-3 periods.

ACTIVITY #42

Mini-unit Topic: Learning About Emergency Vehicles

Approximate Class Time: ½-1 period

Capsule Activity Description: Class discusses the nature of emergency vehicles.

Goal:

To know different kinds of emergency vehicles and the special duties each performs.

Concepts Treated:

- What is an emergency?
- Different kinds of emergencies call for different kinds of services.
- Some emergency vehicles, like fire engines, provide more than one kind of emergency service.
- Speed is of the essence in most emergency situations.

ACTIVITY

Set the stage for other activities on emergency vehicles by asking students to identify what they think the expression denotes and then amplify their comments, as necessary, with the following information. "Emergency vehicle services" refers to assistance provided to citizens through the use of vehicles when speed and special equipment are required to prevent or alleviate injury, suffering, or economic loss. Vehicles regularly involved in providing emergency services include: ambulances, police cars, fire engines, helicopters, airplanes, and Coast Guard rescue boats.

Discuss the importance to the public of having quality emergency vehicles available by enumerating the instances in which such services are essential or valuable. For example, recent medical studies have shown that the care given to the injured or sick in the minutes immediately following an emergency is crucial to the chances for recovery. A recent U.S. Department of Transportation study stated that "23 percent of auto fatalities died of probably survivable injuries due to problems throughout the emergency care system." There has been growing concern in many communities over the wide variations in speed of response and quality of care available. In a matter of such serious personal concern, it is important for a potential user of this type of emergency service to be aware of the emergency care system in his community and when and how to use it.

Through a program of education, the transportation consumer can learn to make responsible decisions about the appropriate service to contact in an emergency, how to contact it, methods of assuring adequate community emergency services, and how to seek redress of grievances. These skills will facilitate not only the use of the service, but also stimulate its communitywide improvement.

Special mention can be made of the use by the public of *the fire department* for all kinds of emergencies, both appropriately and inappropriately. Many residents know that a call for an ambulance or police car may not produce help for as long as an hour ("...there is a backlog of ambulance calls in the South Bronx, and we will have to wait forty-five minutes before one will arrive."*). But turning in a fire alarm will always bring the fire fighters. ("The only real sure thing in this town [New York City] is that the firemen come when you pull the handle on that red box."**) Students need to be aware of both the reliability of this source of emergency help and the selfishness and dangers of using it unnecessarily.

Evaluation Methods:

Students develop an "ideal" emergency vehicle system and then compare it with existing services.

The following activity can be used as an evaluation for this one.

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*New York City fire fighter Dennis Smith in his novel *Report from Engine Co. 82.*

**Dennis Smith again.

ACTIVITY #43

Mini-unit Topic: Learning About Emergency Vehicles

Approximate Class Time: ½-2 periods

Capsule Activity Description: Students evaluate the emergency vehicle needs of their community and develop a plan to provide those vehicles and services that are lacking.

Goal:

To understand the needs of the community (in terms of emergency services) and how to provide for them effectively.

Concepts Treated:

- There are many different kinds of emergency needs.
- Different needs usually call for different kinds of vehicles (for example, ambulances, fire engines, helicopters).
- In the typical community, only some emergency vehicle needs can be met.
- Priorities must be set among emergency needs.
- Sometimes existing services can be upgraded to fill additional needs or meet existing needs better.

ACTIVITY

This activity can be conducted by an entire class, a small group of students, or an individual student. As background for the activity, students identify the quality of services provided to their community by emergency vehicles and then identify what emergency care needs are not currently being met by existing services. Students can make this determination using their own critical judgment and through interviews with local government officials and providers of emergency care, such as ambulance companies, police departments, fire departments, and departments of public health and transportation.

Having made this evaluation, students develop a modest plan to secure for the community a service involving emergency vehicles the group feels is desirable in terms of its costs and benefits, and feasible to obtain. Examples of such goals might be

- Licensing or certification programs and requirements for ambulance drivers or ambulance technicians involving specific training requirements
- Provision of an additional ambulance for the police department or local police station
- Mandatory refresher courses for police (or fire fighters) on the provision of first aid
- Equipping a helicopter for part-time emergency care
- Outfitting a boat solely or primarily for the provision of emergency water and boating safety services
- Securing a ban on parking on one or more narrow streets where passage by fire engines is hampered or made impossible by parked cars
- Securing police enforcement of parking restrictions in fire lanes or in front of hydrants
- Discouraging police from using sirens and speeding when not on emergency business
- Enforcing laws against drivers who fail to pull over in the presence of emergency vehicles rushing to an emergency
- Requesting the community to develop a coordinated emergency service delivery plan in the event of a disaster such as a tornado, explosion, major fire, civil disturbance, or plane or train crash
- Requiring ambulances to provide radio contact with hospitals or police to coordinate rescue efforts and provide advance warning of needed emergency services
- Increasing the allocation of emergency vehicles and services in parts of the community that receive less attention than neighborhoods having more economic or political influence

Students present their plan to the appropriate community agencies and private individuals and seek to have their suggestion(s) acted upon. If no action is forthcoming, students discuss whether alternative methods for achieving their goals are available and whether they should be tried.

Evaluation Method:

Students write a one-paragraph argument that could go into a voter's handbook if there were a referendum in their community on whether or not additional emergency services should be provided. The argument can be either pro or con.

Variations and Supplementary Activities:

Students can poll the public on its opinions regarding unmet emergency vehicle needs in the community.

Students can research attempts by others in the community or people in other communities to improve the quality of emergency vehicles.

Students can debate or discuss priorities in the delivery of emergency services--for example, whether an additional fire engine is needed more than a police ambulance.

MINI-UNIT 13

BEING SAFE WHILE TRAVELING FOR FUN

A lot of traveling is done in order to get someplace, but some is done simply for its own sake. Some people fly for fun, others sail boats or ride motorcycles. It is important to remember that even when out to have fun, safety must not be neglected. Many accidents happen while people are on recreational vehicles. All of them have some potential for danger.

The purpose of this mini-unit is not to discourage use of recreational vehicles but to acquaint students with necessary precautions they should take in order to get the fullest enjoyment out of them. There is no need to give up safety in order to enjoy oneself; neither is it necessary to avoid recreational travel in order to be safe. All that is required is some simple know-how and an awareness of what to do and not to do.

Among the concepts treated are

- The Coast Guard has definite rules about safety equipment a boat must carry.
- Fueling a boat is more dangerous than fueling a car.
- Off-road operation of a vehicle is no guarantee against accidents.
- Railroad tracks, dogs, and pedestrians all can be hazardous to motorcyclists.

MINI-UNIT 13 LESSON PLAN

Being safe while traveling for fun

Activity #	Activities	Class Time
44	DESCRIPTION: Class discusses boating safety. GOAL: To become acquainted with the legally required safety equipment a boat must carry and the basic safety procedures a boat should follow.	1 period
45	DESCRIPTION: Students and teachers discuss why fueling a motor boat can be hazardous and what steps need to be taken to make it a safe procedure. GOAL: To know how to fuel a boat safely.	1 period
46	DESCRIPTION: Students read brochures, instructional materials, and other promotional and descriptive literature about recreational vehicles available from dealers and manufacturers. GOAL: To know different kinds of recreational vehicles and their uses and special dangers.	1-2 periods
47	DESCRIPTION: Students poll motorcycle drivers and salespeople, pedestrians, automobile drivers, and other groups on motorcycle safety. GOAL: To understand the special hazards of motorcycle riding and the appropriate skills and precautions needed to cope with these hazards.	2 periods

Total Class Time: 5-6 periods.

ACTIVITY #44

Mini-unit Topic: Being Safe While Traveling for Fun

Approximate Class Time: 1 period

Capsule Activity Description: Class discusses boating safety.

Goal:

To become acquainted with the legally required safety equipment a boat must carry and the basic safety procedures a boat should follow.

Concepts Treated:

- The Coast Guard has definite rules about safety equipment a boat must carry, including personal flotation devices (PFDs), running lights, whistles and horns, and fire extinguishers.
- There are rules of the road to follow while underway.
- There are basic navigational rules to follow.
- A boat operator is legally liable for any damage his boat does.

ACTIVITY

Students discuss boating safety. Use the attached material as background information for the discussion. You might want to begin the discussion by having the students examine the following facts:

- In 1974, 1446 persons lost their lives in boating accidents. The cause of death in 1314 of these accidents was drowning. Capsizing is the major type of casualty, accounting for 602 of the total deaths, whereas 684 of the fatalities occurred in accidents where there was some fault of the operator in handling the vessel.
- The National Safety Council says that "on the spot" checks generally indicate that 40 to 50 percent of an average group engaged in boating recreation cannot swim or cannot swim well enough to save themselves or others in an emergency.

- The Coast Guard estimates that in 1974 there were about 8.55 million boats in use, suggesting that probably over 40 million persons are engaged in boating activities of some kind.

Students can select one or more of the following "Ten Commandments of Boating" listed by the National Safety Council and discuss in detail what they involve.

10 Commandments of Boating

1. Know your boat.
2. Don't overload.
3. Keep a good lookout.
4. Operate at safe speeds.
5. Respect the weather.
6. Take sufficient fuel.
7. Keep your boat in shape.
8. Carry necessary equipment.
9. Secure your boat properly.
10. Obey the law.

Evaluation Method:

Students develop a set of "commandments" for passengers in a boat.

Students role-play what they, as passengers would do if a person fell overboard. Classroom equipment can be used to stand for the boat, for PFDs, etc.

Variation or Supplementary Activity:

Invite a speaker from the Coast Guard or the Coast Guard Auxiliary to present this material as a lecture.

Dos and Dont's of Safe Boating*

Coast Guard Requirements/Minimum Required Equipment

Equipment	*Class A (Less than 16 feet)*	*Class 1 (16 feet to less than 26 feet)*	*Class 2 (26 feet to less than 40 feet*	*Class 3 (40 feet to not more than 64 feet)*
Back-fire Flame Arrestor	One approved device on each carburetor of all gasoline engines installed after April 25, 1940, except outboard motors.			
Ventilation	At least two ventilator ducts fitted with cowls or their equivalent for the purpose of properly and efficiently ventilating the bilges of every engine and fuel-tank compartment of boats constructed or decked over after April 25, 1940, using gasoline as fuel or other fuels having a flash-point of 110° or less.			
Personal Flotation Devices (PFD)	One approved Type I, II, III or IV device, for each person on board or being towed on water skiis, etc.	One approved Type I, II or III device aboard for each person and, in addition, one throwable Type IV device.		
Bell, Whistle	None	Whistle--one hand, mouth, or power operated, audible at least ½ mile.	Bell--one, which when struck, produces a clear, bell-like tone of full round characteristics One hand or power operated, audible at least 1 mile.	One power operated, audible at least 1 mile.
Fire Extinguisher Portable *When NO fixed fire extinguishing system is installed in machinery space(s).*	At least one B-1 type approved hand portable fire extinguisher. (NOT required on outboard motorboat less than 26 feet in length and not carrying passengers for hire if the construction of such motorboats will not permit the entrapment of explosive or flammable gases or vapors.		At least two B-1 type approved portable fire extinguishers; OR at least one B-11 type approved portable fire extinguisher.	At least three B-1 type approved portable fire extinguishers; OR at least one B-1 type plus one B-11 type approved portable fire extinguisher.
When fixed fire-extinguishing system is installed in machinery space(s).	None	None	At least one B-1 type approved portable fire extinguisher.	At least two B-1 type approved portable fire extinguishers; OR at least one B-11 type approved portable fire extinguisher.
	B-1 Type Approved Hand Portable Fire Extinguishers contain: Foam, 1¼ up to 2½ gallons; or Carbon Dioxide, 4 up to 15 pounds; or Dry Chemical, 2 to 10 pounds; or Freon 2½ lbs.		B-11 Type Approved Portable Fire Extinguishers contain: Foam, 2½ gallons; or Carbon Dioxide, 15 pounds; or Dry Chemical, 10 pounds.	

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*The information on this and the following pages is adapted from *The Skipper's Course*, developed by U.S. Department of Transportation, United States Coast Guard, Office of Boating Safety.

DO'S AND DON'TS OF SAFE BOATING*

Rules of Operation

On-the-Spot Corrections. Under the Boating Safety Act of 1971 the Coast Guard can now do something that they couldn't do before--that is, when in their judgment they observe a boat operating with an unsafe condition (say, grossly overloaded) and they determine the unsafe condition is especially hazardous, they can take action. That is they can terminate that boat's trip by directing the boat to the *nearest* dock (or safe area) and have it stay there until the condition is corrected.

Negligent or Grossly Negligent Operation. If a Coast Guard Boarding Officer observes a boat being operated in a negligent or grossly negligent manner (for example, pulling a water skier through a busy swimming area) this could result in a fine or jail! The difference between negligent and grossly negligent operation is a matter of knowledge or ignorance. Speeding in a zone clearly marked "5 mph make no wake" could be viewed as grossly negligent and could result in either a fine, jail, or both. You are responsible for learning and observing all rules and regulations regarding the operation of your boat. The following subjects are primarily concerned with the operation of your boat--so study them carefully.

Accident Reporting. If you learn and practice all of the safety points in this program there's a good chance you may never have to fill out and send in an accident report. However, some other boat *could* run into you. In this case you might have to fill out an accident report. This is required by law. There are three conditions that require you to fill out and send in a boating accident report. These are

1. When a life is lost due to the accident

2. When someone is injured and incapacitated (laid up) for 24 hours or more

3. Damage of more than $100 to property (including boats)

If these seem general to you, remember it's best to file a report if you have any doubt. If anyone died you *must* file a report immediately. If the report covers injury or damage you must file it within five days. Some states may require reports for less serious accidents, so be sure to check out the laws in your state.

If you ever have to file an accident report you must, if the Coast Guard issued your boat numbers, send it to the Coast Guard Officer in Charge of the nearest Marine Inspection Office. Otherwise, you file the

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*The information on this and the following pages is adapted from *The Skipper's Course,* developed by the U.S. Department of Transportation, United States Coast Guard, Office of Boating Safety.

report with the state that issued your boat numbers. A special form "Boating Accident Report" form number CG-3865 is available at all Coast Guard Stations and Marine Inspection Offices.

Rules of the Road

There is much similarity between the marine rules of the road and the rules we use in driving a car. And just like automotive rules, they exist to help everyone avoid collisions and accidents.

In discussing rules of the road, we're going to use two special terms: "privileged" and "burdened" boats. The privileged boat is the one with the *right of way*. The burdened vessel is the one with the *burden of responsibility* for taking whatever action is best to avoid a collision.

On shore, in an automobile, when we wish to pass or turn, we provide either a hand signal, signal with a directional light, or give a toot on the horn. The purpose is to make certain the other drivers know what you are going to do--so that they won't take some other action that might cause an accident. We do the same things on the water, but use either a whistle or horn.

The length of the blasts, or toots is part of the signalling code. A prolonged blast is four to six seconds long.

A long blast is eight to ten seconds.

A short blast is of about one-second duration.

We all know it does no good to have 20 car horns blowing in a traffic jam. So too, with the rules afloat. Use your whistle signals *only* when the situation requires them.

Further, when there is clearly no danger of collision, no signals are required--anymore than on shore with a car.

Again, rules of the road are just common sense. Action should be taken when it is *clear* that a potentially dangerous situation exists. The action should be *clear* and *decisive* and be taken early enough to be noticed and understood by the other boat.

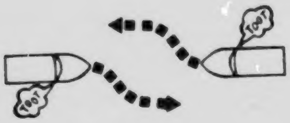
Again, common sense--large vessels can't stop quickly, change course or generally maneuver as well as a small boat. Also, large vessels in harbors and rivers must stay with the channels. They have the right of way and the burden to avoid collisions is on the skipper of the smaller boat.

The danger signal where inland rules apply is four short blasts or toots. When you hear it, you must slow down and maneuver as necessary or stop until the danger condition--or confusion--has been resolved.

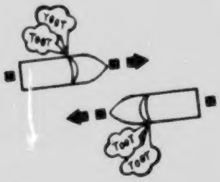
Sailboats, under sail, lack the means of control that may be required for decisive and timely action. Therefore, they have the right of way over a powered boat (but not over large vessels in confined or narrow channels).

There are three types of situations between two approaching vessels that require whistle signals to be given. These are meeting, crossing, and overtaking.

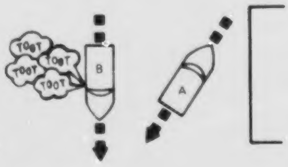
Meeting head-on or nearly so: just as in driving a car, you stay more to your right. One boat gives a single short blast; the other responds with the same signal. Now each skipper knows what the other is going to do--and they've confirmed it.



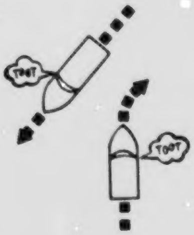
What about meeting but passing well clear of each other--the only time boats may pass each other to the right (starboard-to-starboard)? Again, just common sense--to suddenly change course in order to pass the other boat's left side would create a dangerous situation. Don't count on the other skipper to know that; instead, give him two short blasts. He'll answer with two; and you'll both be relieved that you communicate so well.



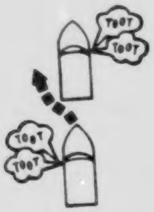
If, at any time, there is confusion about signals or intent, four short blasts is the danger signal--each boat must come to a stop until the situation is clarified. This occurs when one boat gives a proper passing signal, and the other confirms it. In this situation Boat A is backing away from a dock and may not see Boat B who then sounds the danger signal.



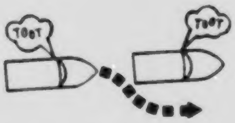
A crossing situation is similar to meeting another car at an intersection that has no stop signs. As ashore, the vehicle to the right is privileged--in fact, he *must* continue his course and speed. Inland rules do not require signals in this situation, but again, common sense should prevail. The boat on the right (privileged) should signal his intent to maintain his course and speed by one short horn blast. The burdened vessel should reply with a short blast signalling his intent to slow down and/or change course to pass astern of the other boat.



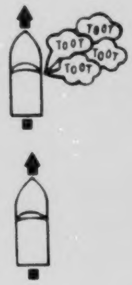
Finally, there are the overtaking situations. Normally, you'd pass the privileged vessel on his left, as you would in a car, and signal this intent with two short blasts. If it is safe to pass, the privileged vessel will respond with two short blasts. Then the privileged boat passes, keeping well clear of the burdened boat.



If it is more reasonable to pass on the privileged boat's right, signal your intent with one short blast. A reply of one short blast gives the go ahead.



Should the privileged vessel consider it unsafe for you to pass as you proposed, it must reply with four short blasts (the danger signal). The burdened vessel must then remain in position and make no further attempt to pass until the privileged vessel answers a one or two short blast signal with one or two short blasts respectively, or proposes a new signal.



When a boat is ready to leave a dock, slip, or mooring--normally the boat is backed out into the regular traffic channel. Few boats maneuver well when going astern and you will be entering an area where there may be several other boats underway. The rules of the road require that you sound one long blast on the horn or whistle (eight to ten seconds) as soon as you clear the dock or slip. This signal must also be sounded when approaching a blind bend in a river or channel. This signal would warn any boat approaching the bend from the other direction. Once in sight of each other, normal rules of the road and maneuvering signals apply.

Navigation Lights

Federal law requires that ALL boats display certain lights at night. These lights will tell others of your presence, what kind of a boat you are: that is, sailboat, motorboat, and even a rowboat. These lights on another boat will tell you whether you're meeting, crossing, or overtaking another boat.

Only three (3) colors are used: red, green, and white. A red light is displayed on the bow's *left* or port side. An easy way to remember is "*Port* wine is *Red.*" A green light is displayed on the bow and indicates the right or *starboard* side. White lights are usually displayed on the back (stern) of boats but may be found on other parts of the boat, especially on larger vessels.

In addition to the colors used and the position of the lights on a boat, lights are "shaded" so that they cannot be seen from certain directions. The amount of light that can be seen from a shaded light is measured in "points." A point is equal to eleven and one quarter degrees (11¼°) of a circle. For example an unshaded light that can be seen from *any* direction would be called a 32 point light because:

$$32 \times 11.25° = 360°$$

A 10 point light can be seen through an arc of 112½ degrees.

Exactly how many white lights should be displayed and where depends on the class (size) of the boat. Check the requirements before you go out at night.

Aids to Navigation

Introduction

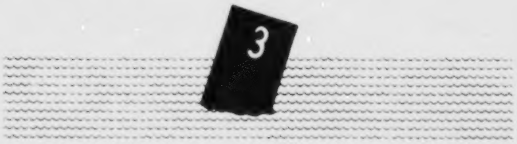
Aids to navigation take the place on the water of street signs and road maps used on land. Aids to navigation are placed at various points along the coasts, rivers, lakes, channels, harbors, etc., as markers and guides to help you locate your position with respect to the shore and to hidden dangers.

All aids to navigation are protected by law. It is not only a VIOLATION OF COMMON SENSE, BUT A CRIMINAL OFFENSE, to cause any damage or hindrance to the proper operation of any aid. Do NOT deface, alter, or move or destroy any aid to navigation. Never tie your boat to a buoy, daybeacon or light structure. AVOID anchoring so close to a buoy that you obstruct the aid from the sight of another boat. If you should unintentionally or unavoidably COLLIDE with or DAMAGE an aid to navigation, this must be reported to the proper authorities.

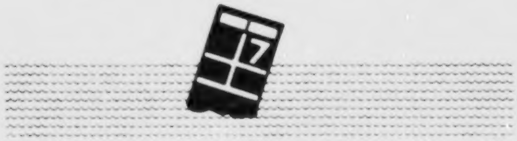
The Lateral System

You can find your way around on the water using buoys and the appropriate charts. The *shape* of a buoy, its *color*, the *number* painted on it, and, when it is lighted, the *light* characteristics all will tell you what to do when piloting your boat.

This buoy is called a CAN buoy because of its cylinder-like shape.



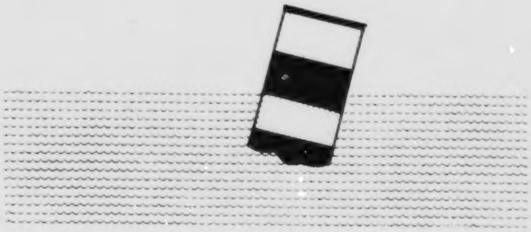
Most of the buoys with this shape will be painted BLACK. The number is always odd, that is 3, 5, 7, 9, and so on. You might see a black can buoy that looks like this:



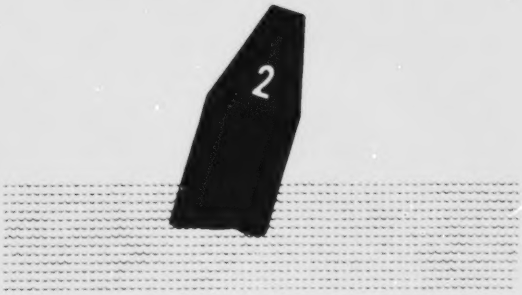
This type of buoy is normally found marking the left side of a channel (as you returned from seaward) and is often used to mark obstructions.

The unusual arrangement on the top of this buoy is called a "radar reflector" which causes it to stand out better on a radar screen. The meaning of this buoy is the same as that of a regular black can buoy.

From time to time you may see a can buoy painted in red and black stripes like this:

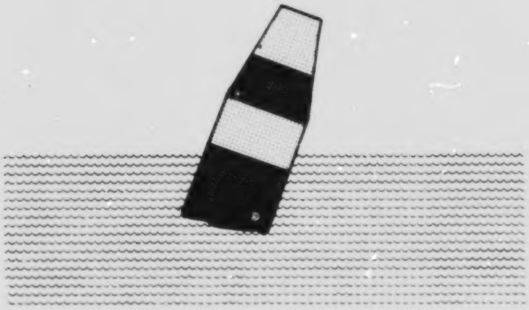


It won't have a number on it, however. This buoy will mark the junction of two channels.

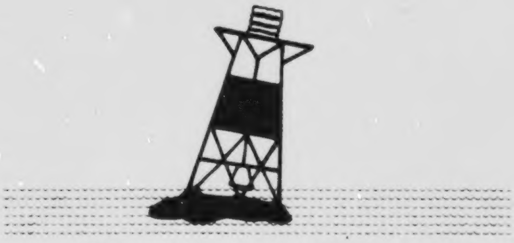


This buoy is called a NUN buoy, again because of its shape. Most of these buoys will be painted solid red and have *white* even numbers on them--2, 4, 6, etc. NUN buoys are almost always used to mark the right side of a channel, as you return from seaward.

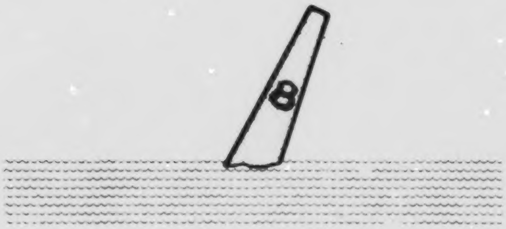
Other NUN buoys may be painted with horizontal red and black stripes. Like striped can buoys, these buoys also mark channel junctions. Like this:



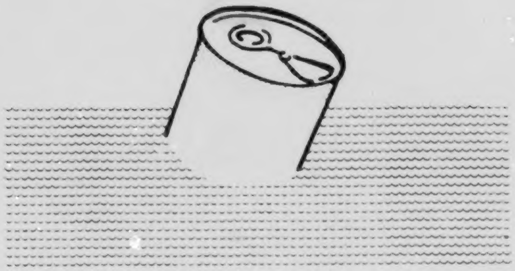
The buoy shown here is a LIGHTED buoy. It may have any of the aforementioned colorings, which define its meaning. It has a light (and sometimes a radar reflector, bell, gong, or whistle) so it may be more easily located in times of low visibility.



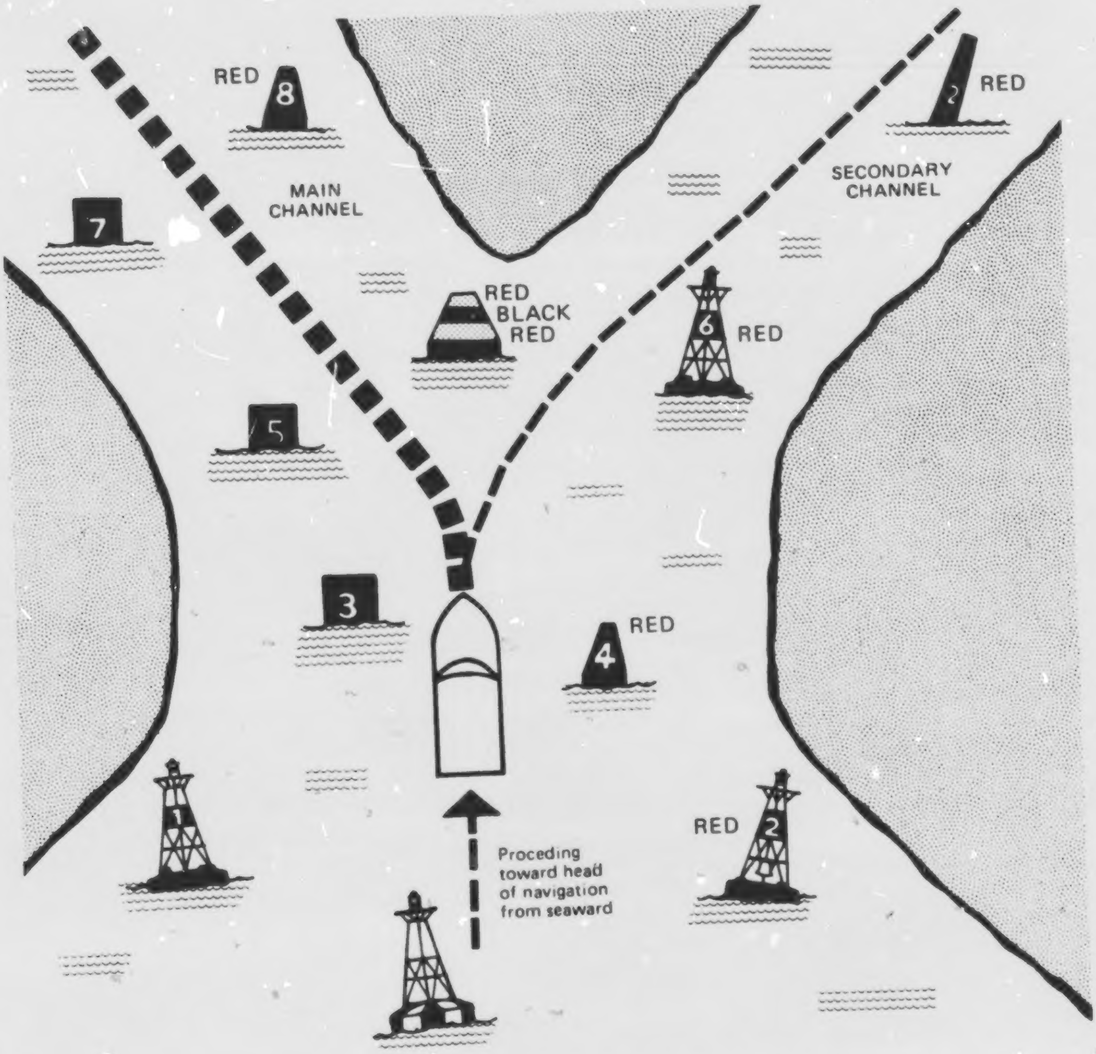
Finally, this buoy is called a SPAR buoy and may be red with even numbers or black with odd numbers. These buoys are used to mark the middle of a channel and are sometimes found marking obstructions.



CAN BUOY



Safe channels or perhaps a water hazard will be marked by buoys. How you pass these buoys or how you follow them to another point is the next thing to learn. A buoy is placed and its identifying characteristics are chosen to mark the safe channel as if entering from "seaward." A lot of skippers remember this rule by memorizing the three R's or *red right returning*. Like this:


RED
8
MAIN CHANNEL
7
RED
SECONDARY CHANNEL
RED
BLACK
RED
6
RED
5
3
4
RED
1
RED
2
Proceding toward head of navigation from seaward

TYPICAL CHANNEL LATERAL BUOY SYSTEM

And of course when leaving port and going out to sea you do the opposite. "Well" you might ask, "what do I do if I'm not entering from seaward?" For boatmen on rivers, going *upstream* against the current is the same as entering from seaward. On lakes when going from the outlet of the lake to its upper end is the same as entering from seaward.

A word of caution: don't regard buoys as immovable objects. They may be missing, drifting, or off their proper position because of storms, tides, and collisions.

ACTIVITY #45

Mini-unit Topic: Being Safe While Traveling for Fun **Approximate Class Time:** 1 period

Capsule Activity Description: Students and teacher discuss why fueling a motor boat can be hazardous and what steps need to be taken to make it a safe procedure.

Goal:
To know how to fuel a boat safely.

Concepts Treated:
- Gasoline is highly explosive.
- Gasoline is heavier than air.
- A spark of static electricity can start a gasoline explosion.
- Fueling a boat is more dangerous than fueling a car.
- Gasoline is most explosive when it is in vapor form.

ACTIVITY

Students and teacher discuss the proper way of fueling a boat, what the dangers are, and what steps need to be taken to make it safe. You should take the lead role here to make sure that all the following important points are mentioned:

Always try to fuel the boat in good light. It's too easy to spill gasoline when it's dark.

Don't smoke and don't allow anyone in or near the boat to smoke while you're filling the tank with gasoline.

Make sure all electrical equipment on the boat is shut off and don't operate any switches while you're fueling.

Keep gasoline fumes out of the boat by closing all doors and hatches. Gasoline fumes (vapor) are much more treacherous than dynamite.

If you use portable tanks, fill them away from the boat. When full, put the caps on tightly and wipe the tanks off.

Keep the metal nozzle of the gasoline hose in contact with the tank *at all times* to prevent a static spark.

Don't spill gasoline--pay attention to what you're doing. Check for leaking fuel line fittings. If some gasoline does spill--don't let it turn to vapor--wipe it up immediately. Get rid of the rag you wiped it up with.

When you're through, put the gaoline tank cap back on tightly. Then check it.

Open up the boat to air it out. Walk around the inside of the boat and give it the sniff test, especially in low places--gasoline vapor is heavier than air and sneakier than nitroglycerin. Ventilate with power blower, if available. Wait a few minutes before you start the engine.

In general, the discussion should let the students see that gasoline is a very dangerous substance. It is highly explosive--that is, of course, why it is used as a fuel in internal combustion engines, but it is also why it needs to be handled with care. Many people tend to forget how dangerous gasoline can be because it is constantly and casually handled at gasoline stations apparently without any untoward results. However, there are important differences between cars and boats in the matter of fueling. If gasoline is spilled in a gas station, it stays behind, on the ground, and soon evaporates. If gasoline is spilled in a boat, it stays in the boat, and--being heavier than air--it collects in the low places of the boat (i.e., around the bilge). Furthermore, there are more safety precautions built into a car than into a boat; for example, there is a firewall between the engine and the passenger compartment and, being on solid ground, a car doesn't sway while it is being fueled, so the danger of spills is lessened.

Evaluation Method:

Students develop a set of commandments for safe fueling. They list the do's and don'ts of fueling, putting the most important ones first.

ACTIVITY #46

Mini-unit Topic: Being Safe While Traveling for Fun

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students read brochures, instructional materials and other promotional and descriptive literature about recreational vehicles available from dealers and manufacturers.

Goal:

To know different kinds of recreational vehicles and their uses and special dangers.

Concepts Treated:

- As in all transportation-related accidents, an accident with a recreational vehicles depends on the persons involved, the machine, and the environment.
- Off-road operation of a vehicle is no guarantee against accidents.
- Gasoline is always a dangerous substance.
- Vehicles that are used mainly in winter add the dangers of winter to those of operation.

ACTIVITY

Either by visiting retail dealerships, writing to manufacturers of recreational vehicles, or both, students collect literature describing snowmobiles, trailers, mopeds (motorized bicycles), campers, dune buggies, etc. The class then breaks into small groups set up around different manufacturers of the same vehicle (e.g., campers) or around different types of recreational vehicles and compares what their materials have to say about the safety considerations involved in purchasing, using, and maintaining these vehicles. Each group may have to break into even smaller groups (or one-person subcommittees) to get further information from dealers, manufacturers, or state agencies on some of the questions below.

- For what types of activities can the vehicles be used?

- What are the potential dangers of each of these activities? (Hazards can include not only dangers of vehicle-related injury but also exposure, freezing, getting lost, being trapped by sudden changes in weather, and mechanical breakdowns.
- What are the performance capabilities and limitations of each vehicle researched? For instance, a jeep-type vehicle often has a high center of gravity and may not be appropriate for very steep grades.)
- What types of support from civilization do these vehicles require, such as gasoline, water, plumbing facilities, and electricity? Are there risks associated with being cut off from these services or materials?
- What kind of precautions are needed when fueling the vehicle?
- What options are available for purchase with each vehicle and what are their safety implications? Do they increase the likelihood of mechanical failure? Do luxury features increase or decrease the safety of the vehicle?
- How useful and how safe, are the vehicles as basic transportation? (Students can consider brakes, tires, maneuverability, visibility, comfort, degree of driving fatigue, gasoline consumption, and ease with which a small person can drive the vehicle.) Are there safety features that are required for automobiles that are not required for some recreational vehicles?
- Are special skills needed to operate any of these vehicles? If so, how can these skills be learned?
- Do any of these vehicles operate in a hostile environment (water, snow, cold weather)? If they do, does this require any special precautions?
- Are there any minimum performance standards which these vehicles should meet (as regards, for example, horsepower, speed, weight, and durability)?
- What safety equipment should be carried with each vehicle? (For example, consider the safety implications of the various types of gas cans, flares, chains, shovels, and blankets.)
- How much emphasis is placed on safety, how much information is provided about safety features, and what warnings are provided about safe operation in the promotional literature for these vehicles?
- What are your state's laws concerning the purchase, registration, licensing, and use of each recreational vehicle?

If there are discrepancies among the various manufacturers with respect to standard and optional safety equipment and features, students discuss why such variations exist and do further research (with manufacturers, local and state agencies, and in the library) to ascertain accuracy of claims in various brochures.

Each group prepares a report which is given orally to the class. Class discussion centers on evaluating the utility and safety of the various kinds and models of recreational vehicles.

Evaluation Method:

Students visit a retail store selling recreational vehicles and question a salesperson about the safety features and safe operating procedures for different recreational vehicles. They report their findings back to the class.

Variation and Supplementary Activity:

Students can invite salespeople and mechanics to class to explain the safety aspects of the recreational vehicles they sell or service.

ACTIVITY #47

Mini-unit Topic: Being Safe While Traveling for Fun

Approximate Class Time: 2 periods, plus out-of-class time

Capsule Activity Description: Students poll motorcycle drivers and salespeople, pedestrians, automobile drivers, and other groups on motorcycle safety.

Goal:

To understand the special hazards of motorcycle riding and the appropriate skills and precautions needed to cope with these hazards.

Concepts Treated:

- Certain types of roads are more hazardous for motorcycles than other vehicles (e.g. gravel roads).
- Railroad tracks, dogs, and pedestrians all can be hazardous to motorcyclists.
- Carrying passengers or packages can add to hazards.
- Proper protective clothing must be worn.

ACTIVITY

Class breaks into small groups, with each group responsible for developing a short questionnaire with which to interview a different type of citizen about motorcycle safety. Possible people to interview include motorcycle drivers, motorcycle passengers, motorcycle salespeople, motorcycle repairpeople, pedestrians, automobile drivers, bicyclists, truck drivers, and bus drivers. Sample questionnaires for motorcycle drivers and automobile drivers are provided at the end of the activity.

After conducting their interviews, groups analyze the results. Each group reports conclusions and findings to class, and class seeks to develop a consensus, based on the opinions of each of the types of citizens interviewed and on their own opinions, of what the major motorcycle safety problems are. Some of the major safety problems you can bring up for discussion if the students' research does not reveal them include

- Driving on hazardous roads--roads with slicks, rocks, rain, ice, litter, gratings, sand, loose gravel, mud, holes, etc.
- Crossing railroad tracks
- Avoiding dogs
- Watching for passengers alighting from parked cars into the lane of traffic
- Carrying packages
- Carrying passengers
- Wearing proper clothing and helmets

Special consideration should be given to wearing proper clothing and helmets. The motorcycle operator should be aware of the important part outer apparel plays in providing protection. Protective outer garments should be sturdy and large enough to provide room for additional clothing underneath for warmth. Garments should be loose enough to assure good mobility for proper control of the motorcycle when in motion. Variable climatic conditions make it possible for the cycle operator to select from a wide range of protective clothing. Many forms of sturdy materials are available from which may be selected a zip-front windproof jacket.

In addition to a windproof jacket the operator should wear gloves with gauntlet type cuffs to prevent wind from entering sleeves. Many outer garments are available in safety colors--largely fluorescent or with fluorescent strips that make the operator more readily visible to drivers of other vehicles.

Safety helmets should be worn at all times; in all but three states they are required to be worn at all times. Several models of helmets are available and the operator should be able to find one that suits his preference. Lightweight helmets are comfortable and give very effective protection. The right time to wear your helmet is *every time* you ride your motorcycle!

Goggles are an essential item and should be worn at all times. Goggles protect face and eyes from flying insects, rocks, and other airborne matter which could cause injury to the eyes. The distraction of even minor contact with a flying object could have more serious consequences if it causes loss of control by the rider. Goggles should be constructed of shatter-proof material; properly ventilated to prevent steam-up which may cause distortion to the field of vision of the wearer; constructed to protect the eyes from foreign matter; and securely fastened so they will not blow off while the motorcycle is in motion.*

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*Discussion on clothing and helmets is taken from *Motorcycle Safety* (Motorcycle Industry Council, Inc.: Washington, D.C.).

Additional information which you can use for discussion purposes or duplicate and hand out to the class is provided on the following pages.

Evaluation Method:

Students observe motorcyclists for one week and catalog the safe and unsafe practices they witness. Class discusses why some unsafe practices may be more common than others and what might motivate motorcyclists to engage in the corresponding safe behaviors.

Motorcycle Safety*

Types of Motor Vehicles Involved in Accidents

In 1974, motorcycles, motor scooters, and motorized bicycles (referred to simply as motorcycles in the rest of this report) comprised 3.7 percent of the total vehicle registrations. These vehicles represented 1.5 percent of the total number of vehicles to all motor-vehicle accidents. Therefore, based on their percentage of total vehicles registered, motorcycles have good experience in the *all accident* picture. However, these vehicles represented 5.6 percent of all vehicles involved in *fatal accidents*. Deaths of operators and passengers of motorcycles totalled 3260.

Passenger cars have the opposite experience from that of two-wheeled motor vehicles. Passenger cars comprised 77.5 percent of the registered vehicles in 1974. They represented 82.0 percent of the vehicles involved in all motor-vehicle accidents and 70.4 percent of those in fatal accidents. In summary, passenger cars were involved in more than their due share of total accidents based on vehicle registrations; motorcycles in less. Passenger cars were involved in less than their share of fatal accidents based on registrations; motorcycles in more.

TYPES OF MOTOR VEHICLES INVOLVED IN ACCIDENTS, 1974

Type of Vehicle	In Fatal Accidents		In All Accidents		Percentage of Total Vehicle Registrations[a]	No. of Occupant Fatalaties
	Number	%	Number	%		
All Types	57,800	100.0%	25,100,000	100.0%	100.0%	[d]
Passenger cars	40,700	70.4	20,600,000	82.0	77.5	26,600
Trucks	11,500	19.9	3,400,000	13.5	18.4	4,900
Truck or truck tractor	7,300	12.6	2,730,000	10.9	17.6	**
Truck tractor and semitrailer	3,300	5.7	440,000	1.7		**
Other truck combination	900	1.6	230,000	0.9	0.8	**
Farm tractors, equipment	170	0.3	16,000	0.1	[c]	150
Taxicabs	240	0.4	150,000	0.6	0.2	150
Buses, commercial	350	0.6	150,000	0.6	0.1	120
Buses, school	160	0.3	43,000	0.2	0.3	50
Motorcycles	3,000	5.2	360,000	1.4		2,900
Motor scooters, motor bikes	260	0.4	16,000	0.1	3.7	260
Other[b]	1,420	2.5	365,000	1.5	**	1,270

Source: Based on reports from 19 state traffic authorities. Vehicle registrations based on data from Federal Highway Administration and International Taxicab Association. Taken from *Accident Facts*, 1975 edition.

[a] Percentage figures are based on numbers of vehicles and do not reflect miles traveled or place of travel, both of which affect accident experience.

[b] Includes fire equipment, ambulances, special vehicles, other. ** Data not available.

[c] These vehicles are not included in total vehicle registrations; estimated number--5,000,000.

[d] In addition to these occupant fatalities, there were 8,700 pedestrian, 1,000 pedalcyclists, and 100 other deaths.

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* From *Motor Cycle Facts* (National Safety Council, August 1975).

Motorcycle Rider Deaths Increase

The number of motorcycles in the U.S. is continuing to rise sharply. Compared with a 78 percent increase in all motor vehicles since 1961, motorcycle registrations increased 734 percent.

Deaths of motorcycle riders increased 1 percent in 1974 over 1973. This increase, the sixth in succession, followed two years of decreases in motorcycle rider deaths. The exact reason for this is not known, but it has been suggested by some authorities that varying enforcement of helmet laws and changes in the laws, and lack of helmet legislation in some states, has had an unfavorable effect.

The mileage death rate for motorcycle riders in 1974 is estimated at about 14 (deaths per 100,000,000 miles of motorcycle travel). Based on data collected by the Federal Highway Administration, the 1974 rate represents a decrease from the 1973 rate of 16. The motorcycle mileage death rate of 14 compares with the overall motor-vehicle death rate of 3.6 which includes pedestrian and nonoccupant as well as occupant deaths.

Severity of Motorcycle Accidents

When a motorcyclist is involved in an accident, his chances of being injured or killed are greater than if he were riding in a vehicle that afforded more protection. Nationally, for all types of vehicles, 8.1 percent of the accidents involved death or injury. State studies have shown that the following percentage of all accidents involving motorcycles resulted in death or injury: Kentucky in 1969, about 88 percent, 93 percent in 1970; Kansas, 88.6 percent in 1966 and 82.4 percent in 1969; North Carolina, 90.3 percent in 1966-67.

Injuries sustained by motorcyclists involved in accidents tend to be more severe than those to people in accidents involving other types of vehicles, according to New York State studies. For example, the most severe type of injury was suffered by 23 percent of those injured in motorcycle accidents, compared to 11 percent of the persons injured in all vehicle accidents. New Jersey had a similar experience with motorcyclists having serious injuries twice as often, percentage-wise, as occupants of all vehicles.

The actual number of motorcyclists injured annually is not known. However, for 1974, the total is indicated to have been slightly more than 350,000, including both minor and severe injuries.

Types of Motorcycle Accidents

Collision with another motor vehicle is the predominant type of motorcycle accident. This type of accident as a percentage of all motorcycle accidents has ranged from 67 percent in Kansas to 82 percent in Illinois.

In collisions with other vehicles, the motorcyclist is not always to blame. Many people have observed that drivers of larger vehicles do not always realize that motorcycles, especially motor scooters and motor bicycles, are also motor vehicles and should be treated as such. In most cases, automobile drivers claim they did not see a motorcyclist in time to avoid an accident. The University of North Carolina Highway Safety Research Center reports that in collisions between motorcycles and automobiles, the automobile driver is more frequently guilty of a traffic violation. For example, Johnson reports that in motorcycle/other motor-vehicle accidents, motorists were most often at fault when one vehicle cut off another.

Noncollision accidents are next in importance. The California Motorcycle Study showed no appreciable difference between the percentage of motorcycle accidents involving running off the road and the nonmotorcycle experience for the same situation; relatively speaking, however, motorcycles overturned in the road much more often than did other vehicles. This latter point was noticed in other state reports also. Motorcycles are involved in few pedestrian accidents.

Contributing Circumstances

Due to different categories of possible contributing circumstances to motorcycle accidents, a complete comparison between the state reports is not feasible. In the total motorcycle accident experience, Wisconsin and Kentucky listed "speed too fast" as the principal circumstance. "Failure to yield right of way" was the most often reported circumstance in Michigan, Illinois, and Kansas. In fatal accidents, these same studies all listed "speed too fast" as the most frequent circumstance.

For drivers of all vehicles, failure to yield right of way was the chief type of improper driving in all accidents; in fatal accidents, it was speed too fast.

Although not specifically mentioned in all state reports, speed usually included speed too fast for conditions. Two states, Vermont and Washington, supplied information on the speed of the motorcycle at the time of the accident. In both studies the speed range most often recorded was 21 mph to 30 mph. The Washington study indicated that standard-size motorcycles tended to be involved in accidents at a somewhat higher speed than lightweight motorcycles were. California reported that 89 percent of the motorcycle accidents in that state occurred at speeds of 40 mph or under compared to about 77 percent for other vehicles.

Roads and Weather

The majority of motorcycle accidents (84 to 96 percent) occur on dry roads. This might be expected since motorcycles are not driven much on wet or icy roads. New York showed that most of the motorcycle accidents in that state occurred on level roads with no traffic control devices present. Accidents happened with equal frequency at intersections and between intersections.

California also showed a majority of motorcycle accidents occurred on straight, level roads; however, the percentage of such accidents was somewhat less than that shown for nonmotorcycles. California likewise listed no traffic controls present in the majority of motorcycle accidents.

According to data from the University of North Carolina Highway Safety Research Center, about 13 percent of the single-vehicle motorcycle accidents were associated with road defects. The North Carolina data also indicated that the most serious defect reported in 7 percent of the single vehicle motorcycle accidents was loose materials on the road surface.

A majority of the accidents took place during daylight hours.

Age, Sex, Residence of Operator

All studies, except New York's, show that a majority of motorcycle operators involved in accidents are young--under 25 years of age. Most of the other studies show from 42 to 66 percent of the motorcyclists in accidents are under 20 years of age.

In excess of 90 percent of the motorcycle operators were male. However, limited information indicates that about 15 to 20 percent of the people killed or injured were females. This would indicate, then, many of the females injured were passengers on the machines.

The Vermont study reported that the motorcycle operator was within five miles of his residence when involved in an accident in 64 percent of the cases; within 15 miles in 79 percent. Other state studies indicate motorcyclists to be local residents in more than three fourths of the accidents.

Passengers

Limited information is available on whether the person injured was an operator or passenger. "Passengers appear to figure more heavily in single-vehicle accidents than in multivehicle accidents," according to the University of North Carolina Highway Safety Research Center. The study also indicated the presence of passengers in 60 percent of the accidents associated with blowouts (possibly due to the additional weight).

Experience of Operator

Limited information is available on the cycling experience of motorcyclists involved in accidents. It can be surmised, however, that most motorcyclists involved in accidents have not had much riding experience since cycling has increased greatly in recent years and the average age of motorcyclists is young. A survey of 123 patients at the Methodist Hospital in St. Louis Park, Minnesota, and at the Hennepin County General Hospital, Minneapolis, revealed that 20 percent were using the motorcycle for only the first or second time. The Vermont study reported 21 percent of the operators had driver's licenses for less than one year. California's motorcycle report showed that four times as many motorcycle accidents than nonmotorcycle accidents involved drivers with less than one year's driving experience.

The Minnesota hospital study mentioned above reported that 70 percent of the injured had either rented or borrowed the motorcycle. A study by the Minneapolis Police Department showed similar results. The Washington State study of 1965-1966 showed that 29 percent of the cyclists involved in fatal accidents did not own the motorcycle which they were riding. While there was a rather wide variation in the percentage of motorcycles which were borrowed in accidents, these and a couple of other studies indicate that the figure is well in excess of 20 percent. This would imply that many motorcycle accident victims were not regular motorcycle operators or passengers or had mishaps early in their cycling experience.

Borrowers of motorcycles were involved in about 23 percent of the reported motorcycle accidents in North Carolina while they drove approximately two percent of the total annual motorcycle mileage, according to the University of North Carolina Highway Safety Research Center.

Training in the proper operation of a motorcycle is an important aspect directly or indirectly involved in most of the above paragraphs. A study of motorcycle accident victims in the Charlottesville, Virginia area showed that 72 percent of the operators had received no instruction in operating motorcycles. One of the three cited major contributing factors in injury-producing accidents involving students at the University of North Carolina, Chapel Hill was "lack of knowledge of the operation of the vehicle on the part of the owners and borrowers, relating particularly to turning, stopping, and riding properly in traffic," according to the specially conducted research report on injuries arising from motorcycle accidents. The Johnson study claims motorcyclists' inexperience and inappropriate use of their vehicle controls while riding figured highly as factors contributing to motorcycle accidents.

The authors of "The California Motorcycle Study" cogently state the following in their conclusion: "In the present writers' estimation, the most important finding of this study concerns the role of age and experience in motorcycle accidents and traffic convictions. Both the regression and chi-square analyses suggest that lack of skill or inexperience are more important factors in motorcycle accidents than in nonmotorcycle accidents. Since level of skill is a partial function of vehicle familiarity, training and licensing, more effort in these areas is indicated...the data indicate that a person who can drive a car safely may not always be able to drive a motorcycle safely. Consequently, serious consideration would be given toward insuring that persons not be authorized to drive motorcycles unless they possess the requisite skill."

Part of Body Injured

All studies show that the head, arm, and leg are the parts of a motorcyclist's body most often injured. The most serious type injury is that occurring to the head. An Illinois study revealed that two thirds of the motorcyclists killed in that state suffered skull fractures. A University of California study indicated that of the 36 motorcycle occupants who remained within 10 to 15 feet of the impact area, 92 percent suffered head injuries and 28 percent died from such injuries; 83 percent of these occupants suffered leg injuries.

Motorcycle Legislation

The high likelihood of death or injury to a motorcycle rider who is involved in an accident has prompted many states to take action to protect the cyclist. Forty-seven states and the District of Columbia require motorcycle riders to wear safety helmets. More than 30 states and the District of Columbia require a special license for motorcycle operation, periodic motorcycle safety inspection, and eye protection. Fifteen of the states require the use of headlight at all times.

Evaluation Method:

Students prepare a list of five rules that motorcycle drivers must follow in order to be safe. These should not be rules that automobile drivers must also follow, but rules that are special to motorcycle driving. The rules should be put in order, so that the most important one comes first.

Sample Interview of Automobile Drivers

Sex: M F

Age: 16-21 22-29 30-39 40-59 Over 59

Have you ever driven a motorcycle: Yes___ No___

Have you ever been a passenger on a motorcycle: Yes___ No___

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1. Have you ever been in an accident or near-accident with a motorcycle? If not, skip to Question 4.
2. Briefly describe the (near-) accident(s). In particular, where did they occur? At what time of day? What caused them?
3. How could each (near-) accident have been prevented?
4. Are there ways in which motorcyclists drive which you feel are dangerous? If so, what are these dangerous driving practices?
5. Do you find it difficult sometimes to see motorcycles? If so, is this especially at night or in bad weather?
6. Do you drive any differently when you see a motorcyclist? If so, what do you do that's different?
7. Do you ever feel angry at motorcyclists? If so, what about them or their driving behavior makes you angry?

Sample Interview of Motorcycle Drivers

Sex: M F

Age: Under 16 16-21 22-29 30-39 40-59 Over 59

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1. Have you ever been in a motorcycle accident? If not, skip to Question 5.
2. Briefly describe the accident(s). In particular, where did they occur? At what time of day? What caused them? Were you wearing a helmet?
3. How much experience did you have driving a motorcycle when each accident occurred?
4. How could each accident have been prevented?
5. Have you had any close shaves driving a motorcycle? If not, skip to Question 7.
6. Briefly describe the near-accident(s). In particular, where did they occur? At what time of day? What caused them?
7. What do you feel are the most serious safety problems for a motorcyclist?
8. Do you ever find yourself taking chances or running risks driving a motorcycle because you get carried away by the fun or sense of power from driving one? If so, have you taken any steps to prevent yourself from running these risks?
9. Do you think certain kinds of people make better motorcycle drivers than others? If so, what kind and why?
10. Do you feel automobile drivers contribute to motorcycle safety problems? If so, in what ways?

BIBLIOGRAPHY

BIBLIOGRAPHY

The Bibliography section is divided into five subsections, one each for automobile safety, pedestrians, boating, emergency vehicles, and other vehicles.

Within each of these five categories, the individual bibliographical entries are divided into

- Teachers materials*
- Student materials
- Audiovisual materials

Following these five subsections are a list of publications and books for teachers and students on transportation safety and related topics covered in this chapter and a list of periodicals.

The individual entries in the teacher, student, and audiovisual sections are presented in the following format:

	Title of Work, authors, date of publication. Number of pages or list of materials. Price.
Type of Material	Description of material with evaluation of material's quality (except for audiovisual materials and supplementary materials) and relevance for transportation consumer education.
	Source from which material may be obtained.**

It should be kept in mind that the inclusion of an item is an estimation of the material's quality and relevance.*** As such, the absence of a teaching material does not *per se* indicate the material is poor. It may be excellent but simply not very relevant.

Following the teacher, student, and audiovisual materials are a list of readings for teachers by which to learn the necessary background to teach about transportation safety and a list of relevant periodicals for use by teachers and students alike. At the end of the Bibliography is a list of government agencies that can be contacted for further information about transportation safety.

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*Students may also find the teacher materials interesting and useful.

**People who order materials from the U.S. Government Printing Office (Superintendent of Documents) should allow ten weeks for delivery.

***A complete discussion of the criteria used to evaluate the materials may be found at the end of this Manual.

Teacher Materials

Traffic Safety '73, 1974. Two volumes. 60 pages each, plus appendices. Free.

Book Paperbound report on the activities of the National Highway Traffic Safety Administration for 1973 in the areas of seat belts, experimental safety vehicles, accident studies, defects investigations, motor vehicle safety standards, and many other automobile safety areas.

National Highway Traffic Safety Administration
U.S. Department of Transportation
400 Seventh and D Streets
Washington, D.C. 20590

National Safety Council Catalogue, 1973. 85 pages. Free.

Catalogue Comprehensive catalogue on all aspects of safety, including driver education and traffic safety. Included are listings of booklets, manuals, films, filmstrips, and posters.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Alcohol and Alcohol Safety, 1972. Volume 1: 307 pages; Volume 2: 243 activities. $12.50.

Guide Comprehensive curriculum materials on all aspects of alcohol use, with considerable attention paid to drinking and driving. The set has two volumes, one a curriculum manual, the other classroom activities. The activities are detailed and constitute the heart of the curriculum. They are creative and designed to achieve behavioral objectives in this highly affective field. An extensive bibliography on alcohol and traffic safety is provided in each set, including classroom materials and teacher guides.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Order No's.: 5003-00087, 5003-00088: Sr. High

To Buy a Car, 1969. Short story: 15 pages (bound separately); Teacher's guide: 10 pages. $1.00.

Guide Short story that forms the core of a unit on how to buy a car. Useful unit is open-ended: the story raises many questions about car purchasing that students can learn the answers to in a variety of ways. The accompanying teacher's guide suggests several follow-up activities, from role-play to class discussions to field trips. There is also a supplemental 30-minute film, *Challenges of Citizenship: Consumer Decision Making,* that can be obtained from the publishers. Unit is oriented to the development of decision-making skills. Can be used by adults.

Lincoln Filene Center
Tufts University
Medford, Massachusetts 02155

Student Materials

Your Next Accident and How to Avoid It, 1959. 15 pages. 25¢.

Pamphlet

Useful as a very quick overview of car safety, including such topics as courteous driving, defensive driving, and car safety. Some students may find the heavy cartoon format condescending or childish. Part of a series of ten pamphlets on highway traffic safety.

Channing L. Bete Company, Inc.
45 Federal Street
Greenfield, Massachusetts 01301

The New Look in Traffic Signs and Markings, 1972. 19 pages. 35¢.

Pamphlet

Sprightly, multicolored pamphlet describing motor vehicle, pedestrian, bicyclist, etc. signs, signals, and pavement markings. Profusely illustrated.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 5001-0027

What Every Woman Should Know About Cars, 1969. 15 pages. 25¢.

Pamphlet

Moralistically phrased suggestions are offered to women drivers on their allegedly special needs and problems, such as driving with children, use of the glove compartment, emergency situations, accidents, and driving alone at night. Some of the suggestions are of the male chauvinist variety, but pamphlet can be used as a stimulus to discussion on whether women have special driving needs and problems. Some students may find the heavy cartoon format condescending or childish. Part of a series of ten pamphlets on highway traffic safety.

Channing L. Bete Company, Inc.
45 Federal Street
Greenfield, Massachusetts 01301

Hold Everything! Why You Should Use Safety Belts, 1962. 15 pages. 25¢.

Pamphlet

Brief, factual discussion of utility of seat belts. Some students may find the heavy cartoon format and injunctive approach condescending or childish. Part of a series of ten pamphlets on highway traffic safety.

Channing L. Bete Company, Inc.
45 Federal Street
Greenfield, Massachusetts 01301

Safety Belt Instructional Package for Driver Education, 1972. 8, 13, 35, and 25 pages. Free, 15¢, 20¢, 25¢.

Pamphlets

Four pamphlets of facts about seat belt use and on teaching about their use. Designed for use in driver education classes, but can be used in other settings. Useful factual information for teachers and students, but classroom approach is not exciting. Pamphlets are (1) overview on teaching about safety belt use *(Safety Belts: A Recommendation to Driver Educators)*; (2) an *Instructor Guide* with suggested classroom activities in very brief form, objectives, and a film list; (3) an *Automobile Safety Belt Fact Book* that treats important issues such as motivating factors in safety belt usage and selling the safety belt habit; also contains a good bibliography; and (4) a *Safety Belt Instructional Booklet* that is a bland programmed instructional text, very brief and not very imaginative.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock No's.: 5003-0068, 5003-0080, and 5003-00077.

There Are Lots of Safety Belt Myths...Why Not Consider the Truths? 1972. 6 pages. 10¢.

Flyer

Quick overview of safety belt myths.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock No.: 488-367-2058F

How to Deal with Motor Vehicle Emergencies (Order No. 505E); *Battery Hazards, Explosions and Jump Starting* (Order No. 502E); *Safety Tips on Use of Headlights* (Order No. 508E); *Studded Tires--What Every Motorist Should Know* (Order No. 514E); *Winter Driving Tips* (Order No. 509E); *Passenger Car Brakes* (Fact Sheet; Order No. 601E); *Automotive Rust--Its Causes and Prevention* (Order No. 501E).

Pamphlets

Single copies of all of these pamphlets may be ordered free.

Consumer Information Center
Department of Transportation
Pueblo, Colorado 81007

Automobile Jacks.

Pamphlet

Single copies available free.

National Highway Traffic Safety Administration
Department of Transportation
Washington, D.C. 20590

Seat Belts Save Lives Only If Used, 1968. 5 pages. Free.

Flyer

Discussion of the importance of using seat belts.

American Automobile Association (AAA)
1712 G Street, Northwest
Washington, D.C. 20006
or local AAA chapter

What to Buy in Child Restraint Systems, 1971. 11 pages. 20¢.

Pamphlet

Discussion, with illustrations and charts, of how to determine what type of children's restraint device to buy in terms of maximum safety. Discussion of child restraint harnesses included.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

ABC's of Drinking and Driving, 1971. 15 pages. 25¢.

Pamphlet

Useful overview of the drinking-driving problem, crammed with facts and statistics and presented graphically and with illustrations. Minor weakness: pamphlet warns of danger of loss of license as a result of DWI conviction and consequent inability to drive. In fact, few drunk drivers are convicted, few of those convicted lose their licenses, and most of those who do continue to drive anyway. In addition, some students may find cartoon format condescending or childish. Approach is not the "If you drink, don't drive" variety; it is the "Know your limits" approach now advocated by the Federal and most state governments. Pamphlet is part of a series on highway traffic safety.

Channing L. Bete Company, Inc.
45 Federal Street
Greenfield, Massachusetts 01301

How to Keep the Life of the Party Alive.

Pamphlet

Single copies of this pamphlet are available free.

National Highway Traffic Safety Administration
Office of Consumer and Public Affairs
Department of Transportation
Washington, D.C. 20590

Are We Letting the Social Drinker Off the Hook? 1971. 3 pages. Free.

Article

Article by a judge who claims that social drinkers are the main drinking-driving problem. Article takes issue with the Department of Transportation's contention that problem drinkers are the major hazard of the highway. The author proposes strict enforcement of drinking-driving laws. Useful for stimulating discussion on who is responsible for alcohol-related accidents and on what should be done about drinking drivers.

Preferred Risk Insurance Company
1111 Ashworth Road
West Des Moines, Iowa 50265

Alcohol and Highway Safety, 1969. 11 pages. Free.

Articles

Compilation of reprints that discuss the difficulty of convicting drunk drivers. Very useful document for discussing the political and legal aspects of the enforcement of traffic safety laws--and, by analogy, of all transportation laws.

Allstate Insurance Company
Allstate Plaza
Northbrook, Illinois 60062

Stop the Drunk Driver, by Guy Halverson, 1970. 44 pages. $1.00.

Pamphlet

Excellent discussion of role of alcohol in traffic accidents, as well as the political and social problems associated with controlling the drunk driver; for example, it does not hesitate to accuse the liquor industry of opposing promising legislation.

Christian Science Monitor
Christian Science Publishing Company
Christian Science Center
Boston, Massachusetts 02115

Automobile Batteries, 1971. 13 pages. 40¢.

Pamphlet

Useful ideas on how to purchase and care for automobile batteries.

General Services Administration
Federal Supply Service
Washington, D.C. 20405

Tires: Their Selection and Care, 1971. 28 pages. 65¢.

Pamphlet

Useful suggestions for buying and maintaining automobile tires.

National Bureau of Standards
U.S. Department of Commerce
Washington, D.C.

Common Sense in Buying a Safe Used Car (Order No. 503E).

Pamphlet

Useful tips on what to look for, what to avoid, what tricks to be on the look-out for. Single copies are available free.

U.S. Department of Transportation
National Highway Traffic Safety Administration
Office of Public Affairs and Consumer Services
Washington, D.C. 20590

Consumer Protection Under the New Antitampering Odometer Law; Fuel Economy, Emissions, and Safety of Small and Large Cars.

Pamphlets

Single copies available free.

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

Buying a Used Car, 1973. 11 pages. Free.

Pamphlet

Tips on buying and financing a used car. Practical suggestions are provided on pricing, inspecting the car, taking a road test, having a mechanical check-up, payment, examination of sales contract, and redress of grievances.

Oregon State University
Extension Service
Corvallis, Oregon
(Extension Circular 823)

To Buy or Not to Buy, 5 pages. Free.

Pamphlet

Tips on how to decide which used car to buy. Excellent suggestions given for on-the-lot tests, driving tests, and mechanical tests a purchaser should perform on used (new, for that matter) cars before buying. Tips are practical, the type a mechanic would recommend. Checklist included is reproduced from *Consumer Reports*.

Division of Consumer Affairs
1100 Raymond Boulevard
Newark, New Jersey 07102

Car Buying Made Easier, 1974. 160 pages (45 devoted to car buying). Free.

Pamphlet

Pamphlet produced by Ford Motor Company, providing tips for buying a car; second section describes Ford automobiles. Car-buying tips are useful and extensive and do not seem to be watered down for the sake of sales.

Ford Motor Company Listens
Post Office Box 1974
The American Road
Dearborn, Michigan 48121

How To Buy a Car (not dated). 24 pages. 25¢.

Pamphlet

Highly practical checklist of on-the-lot, driving, and mechanical shop tests that a potential used car purchaser should complete before buying a used car. Well illustrated with photographs.

Consumers Union
Education Services Division
256 Washington Street
Mount Vernon, New York 10550

Your Wheels--How To Keep Your Car Running, by Chet Cunningham, 1973. 127 pages.

Book

How to make your car a better and safer vehicle.

G. P. Putnam's Sons
New York City, New York

Auto Mechanics, An Introduction and Guide, by A. Edward Little, 1974. 115 pages.

Book

A basic explanation of how various parts of an automobile function.

Franklin Watts, Inc.
New York City, New York

Audiovisual Materials

Instructor Guide, 1972. 2 pages. 15¢.

Bibliography

Instructor guide on safety belt use that has two pages describing 14 relevant films. Annotated with sources for rental or purchase and length provided.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock No.: 5003-00080

Fact and Fiction About Safety Belts, 1973. Color filmstrip; tape; script booklet. $10 (purchase).

Filmstrip

Short filmstrip presentation designed to increase safety belt use by destroying seat belt myths.

General Services Administration
National Archives and Records Service
National Audiovisual Center
Washington, D.C. 20409

National Directory of Safety Films, 1971. 60 pages. $3.59.

Catalogue

Capsule descriptions of safety films that can be rented from the National Safety Council; however, none are evaluated and many included are poor or mediocre. The reader must take pot luck and preview all films ordered before using with students.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Traffic Safety Education Films (not dated). 2 pages. Free.

Catalogue

Annotated list of films on traffic safety, from freeway driving to alcohol-traffic safety.

Nearest American Automobile Association (AAA) office
or AAA Foundation for Traffic Safety
1712 G Street, Northwest
Washington, D.C. 20006

General Motors Motion Pictures, 1973. 54 pages. Free.

Catalogue

Annotated list of 16-mm sound color motion pictures on various aspects of automobile use and safety. All films are loaned without charge.

General Motors Corporation
Public Relations Staff--Film Library
General Motors Building
Detroit, Michigan 48202

Driver Education Aids. Free.

Catalogue

Annotated listing of films and filmstrips on automobile use and safety.

Ford Motor Company
Traffic Safety and Highway Improvement Department
The American Road
Dearborn, Michigan 48121

Films Available from the American Mutual Insurance Alliance and Its Member Companies (not dated). 10 pages, 4 on transportation safety. Free.

Catalogue

List of films on various aspects of automobile safety including skids, roadside boobytraps, and small car crashes. Descriptions of films are provided along with information on where they can be obtained.

American Mutual Insurance Alliance
Communications Department
20 North Wacker Drive
Chicago, Illinois 60606

A Mini-Catalog of Outstanding Films for Driver Education and Traffic Safety (not dated). 6 pages. Free.

Catalogue

List of 22 movies for rent or sale with brief descriptions of each. Topics range from night driving tactics to whiplash.

AIMS Instructional Media Services, Inc.
Post Office Box 1010
Hollywood, California 90028

A Snort History. 6 minutes; color.

Film — Film, with cartoons and live action, that stresses that driving involves risk-taking decisions and then illustrates how the ability to judge the reality of these risks is affected by alcohol.

Denver Alcohol Safety Action Program
1845 Sherman Street
Denver, Colorado 80203

The Decision is Yours, 1972. 92 slides; test; audiotape; curriculum guide. $10 (purchase).

Filmstrip — Filmstrip on the hazards of drinking and driving that tries to present the facts and leave the decision of whether to drink and drive up to the viewer. Filmstrip is geared specifically to driver education classes. Slides are of drunk driving behavior and factual information about alcohol's physical and behavioral effects. Places are provided in the filmstrip for stopping the audio and discussing the ideas presented. However, the presentation does not in fact leave the decision up to the viewer, but is loaded to elicit the obvious "don't drink and drive" decision.

National Audiovisual Center
General Services Administration (GSA)
Washington, D.C. 20409

Ladies and Gentlemen of the Jury. 27½ minutes; color; 16 mm.

Film — Film that shows, through a story, the problem drinker as a highway hazard and the public's failure to recognize the problem.

U.S. Department of Transportation
Office of Alcohol Countermeasures
Nassif Building
Seventh and D Streets, Southwest
Washington, D.C. 20590

DWI--Phoenix. 27 minutes; color.

Film — This documentary film shows how one city is finding a way to protect itself against drunk drivers *via* a compulsory-attendance traffic education course for drivers involved in accidents while intoxicated.

All orders must be placed through the local AAA Club. For the address of the local club, write

AAA Foundation for Traffic Safety
734 Fifteenth Street, N.W.
Washington, D.C. 20005

The Bottle and the Throttle. 10 minutes; black and white.

Film This film reveals the effects of drinking on driving. Statistics are used as well as a story about an accident involving teenagers.

Sid Davis Productions
1046 South Robertson Boulevard
Los Angeles, California 90035

How Much Is Too Much? 15 minutes; color.

Film This film shows people determining for themselves how much is too much and records their actions at different levels of intoxication.

Wisconsin ASAP
University of Wisconsin
Institute of Governmental Affairs
311 State Street
Madison, Wisconsin 53703

Point Zero Eight. 30 minutes; black and white.

Film Eight of Canada's foremost rally and racing drivers are subjected to exacting tests to determine the degree a given amount of alcohol in the blood can affect their skill and ability to react.

CTV Television Network Ltd.
42 Charles Street
Toronto 5, Canada

The Drinking Driver. 27 minutes; color.

Film This film presents basic elements needed for an effective community countermeasures program.

U.S. Department of Transportation
Office of Alcohol Countermeasures
Nassif Building
7th and D Street, S.W.
Washington, D.C. 20590

A New Look at the Old Sauce. Filmstrip; 35 mm; 17 minutes; record; color.

Film Animated cartoon depicting history and effects of alcohol; drinking patterns, alcoholism, and drinking and driving.

Texas Commission on Alcoholism
809 Sam Houston State Office Building
Austin, Texas 78701

Pedestrian Safety

Teacher Materials

A New Look at Pedestrian Safety, 1975. 16 pages. Single copies free.

Pamphlet Brief analysis of pedestrian accidents, countermeasures that may be taken, and national pedestrian needs.

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

Urban Pedestrian Accident Countermeasure Experimental Evaluation: Volume 1. Behavioral Evaluation Studies, 1975. 107 pages. $4.25.

Study Somewhat technical study of the extent to which nine pedestrian safety countermeasures effectively reduced pedestrian accidents. Considerable useful discussion on the causes of pedestrian accidents and how to prevent them.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151

Student Materials

A-B-C's of Pedestrian Safety, 1969. 15 pages. 25¢.

Pamphlet Discussion for drivers and pedestrians of pedestrian safety. Moralizes too much about what pedestrians and drivers should and shouldn't do. Topics discussed include intersections, night time and bad weather, youthful and elderly pedestrians. Topics are covered very briefly in a heavy cartoon format that some students may find condescending or childish. Part of a series of ten pamphlets on highway safety.

Channing L. Bete Co., Inc.
45 Federal Street
Greenfield, Massachusetts 01301

Audiovisual Materials

Transportation Safety Films. 2 pages. Free.

Catalogue Annotated list of films on traffic safety, from freeway driving to pedestrians.

Contact nearest American Automobile Association (AAA) office or
AAA Foundation for Traffic Safety
1712 G Street, N.W.
Washington, D.C. 20006

Boating Safety

Teacher Materials

Better Boating: A Guide to Safety Afloat, 1973. 79 pages. 65¢.

Guide Comprehensive guide on primarily motor boating covering types of boats, equipment, navigation, safety, and emergency measures. Well illustrated but completely factual approach. Suggested class activities are not detailed. Student booklets also available.

Better Boating
Outdoor Empire Publishing, Inc.
511 Eastlake Avenue E
Seattle, Washington 98109

Student Materials

Personal Flotation Devices: Requirements for Recreational Boats (not dated). 3 pages. Free.

Flyer Brief description of various types of what used to be called life preservers and are now called personal flotation devices (PFDs). Useful for deciding which one(s) to purchase.

Department of Transportation
United States Coast Guard
(G-BBE-1)
Washington, D.C. 20590

This Is the Seal of Safety (Aux-204). Free.

Pamphlet Description of U.S. Coast Guard Auxiliary. Contains both Auxiliary and Federal equipment standards.

Department of Transportation
United States Coast Guard
(G-BAU)
Washington, D.C. 20590

The Skipper's Course. $1.50.

Pamphlet Self-instructional booklet on all aspects of boating safety and operation. Provides information and then self-administering questions ("quick quiz") after each section to test learning. Many of the issues covered deal with large pleasure craft, but problems that would affect rowboats, sailboats and canoes are also dealt with. Includes 11 cartoons.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

(Almost) Everything You Ever Wanted to Know About Boating... (CG-428), 1972. 24 pages. Free.

Pamphlet Humorous treatment of basic boating operation and safety, including limericks, witty sayings, cartoons, and quiz questions.

Department of Transportation
United States Coast Guard
(G-BBE-2)
Washington, D.C. 20590

Basic Canoeing, 1963. 63 pages. 50¢.

Pamphlet Useful discussion for beginners that deals with the evolution of the canoe, selecting a canoe, accessories, carrying and launching, boarding and debarking, paddling strokes, safety, care and repair, cartop transportation, and artificial respiration.

American Red Cross
17th and D Streets, N.W.
Washington, D.C. 20006
(or local chapter)

Canoeing Textbook, 1956. 445 pages. $1.75.

Textbook Comprehensive treatment of all areas of canoeing, including accessories, launching and boarding, paddling, rescue, racing, trips, and repairs.

American Red Cross
17th and D Streets, N.W.
Washington, D.C. 20006
(or local chapter)

Basic Sailing, 122 pages. 75¢.

Pamphlet Useful discussion that treats the fundamentals of sailing small craft. Topics discussed include sailboat designs, types, equipment, sails, basic racing rules, and rough weather sailing. Illustrated.

American Red Cross
17th and D Streets, N.W.
Washington, D.C. 20006
(or local chapter)

Basic Rowing, 1964. 80 pages. 50¢.

Pamphlet Booklet designed as a reference source for the American Red Cross rowing courses. Well illustrated, it gives basic information on rowing craft, types, materials, equipment, boarding and debarking, rowing, knot tying and use of lines, anchoring, towing, safety and rescue, boat care, and artificial respiration.

American Red Cross
17th and D Streets, N.W.
Washington, D.C. 20006
(or local chapter)

Basic Outboard Boating, 1964. 98 pages. 75¢.

Pamphlet Well illustrated and useful discussion that deals with definition and classification of motorboats, boat selection, outboard rig, equipment requirements, rules of the road, the outboard motor, troubleshooting, fueling, starting, knot tying and use of lines, anchoring, piloting and navigational aids, safety and rescue, accident reporting, weather, and artificial respiration.

American Red Cross
17th and D Streets, N.W.
Washington, D.C. 20006
(or local chapter)

Principles of Safe Sailing, 1971. 123 pages. $3.95.

Book Large (8½" x 11") paperback volume provides detailed information on such topics as how to sail, weather problems, rough water, maintenance, and purchasing sails. Well illustrated.

Motor Boating and Sailing Books
The Hearst Corporation
959 Eighth Avenue
New York, New York 10019

Federal Requirements for Recreational Boats (Order #CG-290), 1973. 14 pages. Single copies free.

Pamphlet Description of Federal requirements that must be met by owners of motor boats, including registration, reporting accidents, and minimum safety equipment.

Department of Transportation
United States Coast Guard
Washington, D.C. 20590

Marine Communications for the Boating Public (Order #CG-423). Single copies free.

Pamphlet Detailed information of what someone aboard a vessel in trouble or observing another vessel in difficulty should radio. Contains a tear-out marine emergency and distress information sheet.

Department of Transportation
U.S. Coast Guard
Washington, D.C. 20590

A Pocket Guide for Visual Distress Signals (Order #CG-152). 17 pages. Single copies free.

Pamphlet Useful discussion of how boat operators should signal for help in an emergency using hand signals, flags, and special equipment (flares, lights, and radios).

U.S. Department of Transportation
United States Coast Guard
Washington, D.C. 20590

Publications for Safe Navigation, 1973. 5 pages. Free.

Pamphlet Description of nautical charts and chart-related publications, including prices and ordering sources.

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Survey
6501 Lafayette Avenue
Riverdale, Maryland 20840

Marine Weather Services, 1972. 5 pages. Free.

Pamphlet Description of sources for weather forecasts and warnings and marine weather services charts. Also included are weather display signals and weather rules for safe boating.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Coast Guard Official Recreational Boating Guide, 1971. 96 pages. 60¢.

Pamphlet Excellent, comprehensive guide to boating equipment, operating responsibilities, navigation aids, safety, and emergency procedures. Lists of Coast Guard District Offices and government publications are provided. Well illustrated. Primarily for the motor boater.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 5012-0056

Emergency Repairs Afloat (CG-151), 1973. 11 pages. Free.

Pamphlet A boatman's pocket guide to engine troubleshooting, emergency repairs, how to stay afloat, and recommended basic hand tools and spare parts.

Department of Transportation
United States Coast Guard (G-BBE-1)
Washington, D.C. 20590

Coast Guard Aids to Navigation (CG-193), 1972. 27 pages.

Pamphlet Detailed description of basic principles underlying the marking of coasts and waterways with lights, fog signals, radio beacons, and buoys. Well illustrated.

Department of Transportation
United States Coast Guard (G-CAS-2)
Washington, D.C. 20590

First Aid for the Boatman (Order #AUX 206). Single copies free.

Pamphlet Department of Transportation
U.S. Coast Guard
Washington, D.C. 20590

Audiovisual Materials

Search and Rescue: Pleasure Craft, 1969. 16 mm; 26 minutes; color. $88 (purchase); free rental.

Film Movie that portrays search and rescue aspects of boating safety. Probably too technical or narrowly devoted to expensive pleasure craft to be useful in many classes. Defines the proper procedure to be followed by distressed vessels in obtaining search and rescue assistance.

Rental: Local Coast Guard District Office
Purchase: National Audiovisual Center (GSA)
Washington, D.C. 20490

Suddenly and Without Warning, 1971. 16 mm; 6 minutes; color. $25 (purchase); free rental.

Film Movie on safety hazards of falling overboard. Probably the most useful aspect of boating safety in terms of the number of people for whom the problem may arise. Graphic action scenes depict the most common types of falls overboard from pleasure boats. Shows buoyant life-saving devices, their uses, and how to wear them properly.

Rental: Local Coast Guard District Office
Purchase: National Audiovisual Center (GSA)
Washington, D.C. 20409

Boating Safety - B: Courtesy Afloat, 1962. 16 mm; 16 minutes; color. $63 (purchase); free rental.

Film Movie on safety for small boat operators. Film is designed for all boatmen, but particularly for those who operate less than 26-foot boats. Proper fueling, use of signalling devices, courteous and safe operation in swimming areas, and awareness of weather are discussed.

Rental: Local Coast Guard District Office
Purchase: National Audiovisual Center (GSA)
Washington, D.C. 20409

The SOS Course: An Introduction to Safe Boating. 69 pages of text, 7 pages of instructions; 198 35-mm color slides. $28.50. (purchase).

Slides A slide presentation on many aspects of boating safety. Approximately two hours in length. Designed to be used as a teaching device by an individual with little or no boating safety experience by employing the slide narrative contained in the SOS course.

National Audiovisual Center (GSA)
Washington, D.C. 20409

What Now, Skipper? 1973. 16 mm; 20 minutes; color. Purchase: $78.00; free rental.

Film Through a combination of dramatic live demonstrations and colorful graphics, this film depicts the recommended procedures for selecting, maintaining, and using marine fire extinguishers. This film is intended for use in familiarizing the boating public with the Federal requirements for fire extinguishers and their proper use on the pleasure boat. Humor and cartoon characters have been included in the film to maintain viewer interest.

Rental: U.S. Coast Guard District offices
Purchase: The Sales Branch
National Audiovisual Center (GSA)
Washington, D.C. 20409

Revolutionary Regulations, 1973. 16 mm; 18 3/4 minutes; color. Purchase: $75.75; free rental.

Film Explains new personal flotation device (PFD) regulations that were effective 1 October 1973. Our hero falls asleep while studying the new regulations, and in an entertaining dream sequence, he and his wife wander through a colonial American setting. They meet several interesting characters who explain in detail the four types of PFDs, their performance characteristics, and the carriage requirements for recreational boats.

Rental: U.S. Coast Guard District offices
Purchase: Sales Branch
National Audiovisual Center (GSA)
Washington, D.C. 20409

Emergency Vehicles

Teacher Materials

None identified.

Student Materials

Highway Ambulance Service, 1969. 65¢.

Pamphlet Superintendent of Documents
Government Printing Office
Washington, D.C. 20402
Order No. TDs. 202:AM 7

Economics of Highway Emergency Ambulance Service, 1968. $3.00.

Report National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Order No. PB-11-6541

Accidental Death and Disability: The Neglected Disease of Modern Society, 1970. 38 pages. Free.

Pamphlet
Commission on Emergency Medical Services
American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

Developing Emergency Medical Services--Guidelines for Community Councils.

Pamphlet
Commission on Emergency Medical Services
American Medical Association
535 Dearborn Street
Chicago, Illinois 60610

Helicopters in Emergency Medical Service: NHTSA Experience to Date, 1972. 27 pages. 40¢.

Pamphlet
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402
Order No. TD 8.2: H:36
Stock No. 5003-00112

Rescue from Air and in Space, by Captain James C. Sparks, Jr. 155 pages.

Book
A history of man's development of rescue operations in both air and space.

Mead Dodd & Co.
79 Madison Avenue
New York, New York 10016

Questions and Answers, Emergency Medical Services, 1973. 6 pages. Free.

Flyer
U.S. Department of Transportation
Rescue and Emergency Medical Services Division
Washington, D.C. 20590

To Die or Not to Die--What Is Your Communities' Answer? Emergency Medical Services, 1973. Free.

Flyer
U.S. Department of Transportation
Rescue and Emergency Medical Services Division
Washington, D.C. 20590

A Helicopter Ambulance Service--Do You Need It? Can You Justify It? Can You Afford It? 1973. 4 pages. Free.

Flyer U.S. Department of Transportation
Rescue and Emergency Medical Services Division
Washington, D.C. 20590

Audiovisual Materials

On The Scene, (not dated). 16 mm; 28 minutes; color. Purchase: $125.00; free ten-day loan.

Film Film on police use of helicpoters with a five-minute segment on emergency medical services.

Director of Public Relations
Bell Helicopter Co.
P.O. Box 482
Fort Worth, Texas 76101

Other Vehicles

NOTE: No works dealing with bicycle safety are included here, since all aspects of bicycling are treated in Chapter 4 of this Manual.

Teacher Materials

None Identified.

Student Materials

Trailer Pointers and Driving Hints for Passenger Car Owners, 28 pages. Free.

Pamphlet Informative discussion of how to drive with a trailer and how to maintain them in safe operating condition. Well illustrated.

American Automobile Association (AAA)
Traffic Engineering and Safety Department
1712 G Street, N.W.
Washington, D.C. 20006
(or local AAA club)

Minibike Background Information, 1971. 6 pages. Free.

Flyer Useful discussion of minibikes in terms primarily of safety but also in terms of sales, purchase considerations, and design specifications.

American Automobile Association (AAA)
Traffic Engineering and Safety Department
1712 G Street, N.W.
Washington, D.C. 20006
(or local AAA club)

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Mini-bike Guide.

Periodical Magazine that treats safety and other issues related to purchase and use of mini-bikes.

Mini-Bike Guide
P.O. Box 1880
Huntington Beach, California

Motorcycle Safety (Order #506E). Single copies free.

Pamphlet Department of Transportation
Consumer Information Center
Pueblo, Colorado 81007

Motorcycles and Their Operation, 1972. 20 pages. 14¢.

Pamphlet Overview of motorcycle problems, including discussion of increase in registration, accident records, maintenance, licensing procedures, and legislation. The resources section on literature, films, and magazines is very useful.

American Automobile Association
Traffic Engineering and Safety Department
1712 G Street, N.W.
Washington, D.C. 20006

Guide to Safe Motorcycling, 1971. 47 pages. 4¢.

Pamphlet A useful, comprehensive manual for motorcycle drivers on operation, maintenance, and safety. Humorous cartoons enliven a dry text.

American Automobile Association
1712 G Street
Washington, D.C. 20006

Motorcycle Safety (not dated). 15 pages. Free.

Pamphlet Brief discussion of motorcycle safety topics including operating motorcycle control features, common hazards, and proper riding apparel.

Motorcycle Industry Council, Inc.
1001 Connecticut Avenue, N.W.
Washington, D.C. 20036

Motorcycling and You, 1969. 15 pages. 25¢.

Pamphlet Brief, introductory discussion of motorcycling safety. However, pamphlet is not only skimpy but injunctive in approach, and although its admonition that motorcyclists must drive better than automobile drivers is wise, its claim that motorcycling is not dangerous if riders know their machine, obey traffic laws, and ride carefully and skillfully is misleading. Topics covered include use of brakes and gears, defensive driving, steering, and helmets. Some students may find cartoon format and injunctive approach condescending or childish. Part of a series of ten pamphlets on highway traffic safety.

Channing L. Bete Co. Inc.
45 Federal Street
Greenfield, Massachusetts 01301

Intelligent Motorcycling, 1966. 64 pages. Free.

Pamphlet Reprints of ten in-depth articles from *Cycle World* on such topics as maintenance, safety, selection, and riding double. Although written for motorcycle enthusiasts, articles contain sound advice; overall emphasis is on safe driving. Written in a relaxed chatty style.

Parkhurst Publishing Company
745 West 3rd Street
Long Beach, California 90812

To The Proud New Owner of a Trailbike..., 1972. 38 pages. Free.

Pamphlet Informal advice to the new motorcycle owner on such topics as safety, politeness, repairs, dress, and routes.

Motorcycle Industry Council, Inc.
1001 Connecticut Avenue, N.W.
Washington, D.C. 20036

Common Sense Tips for Safe Sportcycling, 1967. 33 pages. Single copies free.

Pamphlet Motorcycle information on causes of accidents, maintaining motorcycles in safe riding condition, buying a used motorcycle, dressing for the ride, and the art of defensive driving. Good illustrations and photographs are provided.

Yamaha International Corporation
Yamaha Parts Distributors, Inc.
P.O. Box 6610
Buena Park, California 90620

Minibikes, by Gordon Jennings. 91 pages.

A guide to buying, riding and maintaining a minibike.

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey

Audiovisual Materials

Motorcycles: Safety Education Data Sheet No. 98 (not dated). 7 pages (½ page on films). 68¢ for 10 copies.

Bibliography

General pamphlet that contains list of films on motorcycles. List is not annotated or evaluated.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

National Directory of Safety Films, 1971. 60 pages. $3.50.

Catalogue

Capsule description of safety films that can be rented from the National Safety Council; however, none are evaluated and many are included that are either poor or mediocre. The reader must take pot luck and preview all films ordered before using with students.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Motorcycles and Their Operation, 1972. 20 pages. 14¢.

Bibliography

Overview of motorcycle problems with a resource section of 24 films, including ordering sources and prices.

American Automobile Association
Traffic Engineering and Safety Department
1712 G Street, N.W.
Washington, D.C. 20006

It's Not Where You're Going--It's How You Get There and Back. 16 mm; 10 minutes; color. $45.00 (purchase).

Film

A film on safe trailering practices developed by the Werthmann Group in cooperation with the U.S. Coast Guard.

Werthmann Group, Inc.
1933 Vernier Road
Grosse Pointe Woods, Michigan 48236

Background Literature for Teachers on Transportation Safety

The materials in this section can be of direct assistance to teachers and curriculum developers for obtaining necessary background information in the field of transportation safety in order then to develop and teach curriculum materials. It should be noted that most of the materials included in the "Student Materials" section of the Bibliography may also be read profitably by curriculum developers and teachers to obtain this background information.

The materials are listed alphabetically by author under each transportation topic.

Automobile Safety

Amrine, Michael, *The Safe Driving Handbook* (Grosset and Dunlap: New York, 1970).

Burby, John, *The Great American Motor Sickness* (Little, Brown and Company: Boston, Massachusetts, 1971).

Fales, Edward D., *Belts On, Buttons Down; What Every Mother Should Know About Car Safety* (Delaconte Press: New York, 1971).

Nader, Ralph, *Unsafe at Any Speed* (Bantam Books: New York, 1972; revised, 1973).

Bicycles

Alth, Max, *All About Bikes and Bicycling* (Hawthorne Books, Inc.: New York, 1972).

Boethling, Bob (ed.), *The Bicycle Book* (Price, Stern, Sloan Publishers: Los Angeles, California, 1972).

Consumer Guide, *Consumer Guide Bicycles: Complete Bicycle Buying Guide* (Popular Library: New York, 1972).

Coombs, Charles, I., *Bicycling* (William Morrow & Company, Inc.: New Jersey, 1972).

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Cuthbertson, Tom, *Bike Tripping* (Ten Speed Press: Berkeley, California, 1972).

Frankel, Lillian, and Godfrey Frankel, *Bicycle Book* (Sterling Publishing Co., Inc.: New York, 1972).

Henkel, Stephen C., *Bikes* (Chatham Press, Inc.: Riverside, Connecticut, 1972).

MacFarlan, Allan A., *The Boy's Book of Biking* (Pocket Books: New York, 1970).

McFarlane, John W., *It's Easy to Fix Your Bike* (Follet Publishing Co.: Chicago; revised, 1973).

McIntyre, Bibs, *The Bike Book* (Harper & Row: New York, 1974).

Wagenvoord, James, *Bikes and Riders* (Van Nostrand Reinhold, Co.: Cincinnati, Ohio, 1972).

Boating Safety

Andrews, Howard, L., and Alexander L. Russel, *Basic Boating: Piloting and Seamanship* (Prentice Hall: Englewood Cliffs, New Jersey, 1974).

Drinking and Driving

1968 Alcohol and Highway Safety Report (U.S. Government Printing Office: Washington, D.C., 1968).

Bacon, Margaret and Mary Brush Jones, *Teen-age Drinking* (Thomas Y. Crowell: New York, 1968).

Bacon, Sheldon D. (ed.), *Studies of Driving and Drinking* (Rutgers University Center of Alcohol Studies: New Jersey, 1968).

Halverson, Guy, *Stop the Drunk Driver* (The Christian Science Publishing Society: Boston, Massachusetts, 1970).

Maddox, George, L. and Bevode C. McCall, *Drinking Among Teenagers; A Sociological Interpretation of Alcohol Use by High School Students* (Rutgers University Center of Alcohol Studies: New Jersey, 1964).

Voas, R. B., and Len Tabor, *The Relationship of Alcohol Abuse to Highway Safety* (U.S. Department of Transportation, National Highway Traffic Safety Administration: Washington, D.C., 1970). Catalogue #H5810165.

Emergency Vehicles

Keller, Hartmut, *An Analysis of Freeway Emergency Service Systems* (National Technical Information Service: Springfield, Virginia, 1969). Catalogue #AD 695-378.

Recreational Vehicles

Malo, John W., *Snowmobiling: The Guide* (MacMillan: New York, 1972).

Malo, John, *All Terrain Adventure Vehicles* (McMillan: New York, 1972).

Thomas, James Lee, *Safe Snowmobiling: Fun Without Damage* (Sterling Publishing Co.: New York, 1971).

Tuite, James J., *Snowmobiles and Snowmobiling* (Tower: New York, 1971).

U.S. Department of the Interior, *Offroad Recreation Vehicles* (U.S. Government Printing Office: Washington, D.C., 1972).

Wallace, Clarke, *The Complete Snowmobile* (Scribner: New York, 1972).

Wimer, Sally, *The Snowmobiler's Companion* (Scribner: New York, 1973).

*Periodicals**

American Motorcycle Association News
5655 North High Street
Worthington, Ohio 43085

Changing Times
The Kiplinger Magazine
Editors Park, Maryland 20782

Coast Guard Boating Safety Newsletter
Department of Transportation
Office of Boating Safety
400 Seventh Street, S.W.
Washington, D.C. 20590

Consumer Educator
National Association of Secondary School Principals
2101 Sixteenth Street, N.W.
Washington, D.C. 20036

Consumer News
Federal Office of Consumer Affairs
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Consumer Reports
Consumer's Union
256 Washington Street
Mt. Vernon, New York 10550

Mini-Bike Guide
P.O. Box 1880
Huntington Beach, California

Motor Trend Magazine
8490 Sunset Blvd.
Los Angeles, California 90069

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*For bicycle magazines, see the Bibliography at the end of Chapter 4.

New Directions in Bike Safety
Bicycle Institute of America
122 East 42nd Street
New York, New York 10017

Newsletter of the American Council on Consumer Interests
238 Stanley Hall
University of Missouri
Columbia, Missouri 65201

Of Consuming Interest
Federal State Reports
P.O. Box 986
Arlington, Virginia 22216

Road and Track Magazine
P.O. Box 2324
FDR Post Office
New York, New York 10022

Skylights
National Aerospace Education Council
Suite 310
806 Fifteenth Street, N.W.
Washington, D.C. 20005

Sno Goer
1999 Shepard Road
St. Paul, Minnesota 55116

Traffic Safety
The National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

BICYCLES

BICYCLES AND BICYCLE SAFETY: AN OVERVIEW

The Problems

The use of bicycles by people of all ages has increased tremendously in the United States: In 1965 bicycle sales were 5.6 million, in 1970 they were 6.9 million, and in 1976 they reached 8.1 million. In 1973, a peak year for bicycle sales, 15.2 million bicycles were sold. In that year more bicycles were purchased than automobiles. There are 100 million bicycles currently in use, and it is expected that half the nation's population will be bicycle riders by 1980.

The increased number of bicycles has magnified the need to educate people about bicycle safety. In 1974 the Consumer Product Safety Commission singled out bicycles as the most hazardous product on the American market and estimated that bicycles and the equipment associated with them were responsible for 460,000 injuries requiring emergency room treatment each year. Nearly three bicyclists are killed in accidents every day--or over 1000 a year. There are also more than a million bicycle injuries annually, including 60,000 concussions and 120,000 fractures.

The increase in bicycle sales recorded over the last few years has been accompanied by rising public interest in better biking facilities. Thus, many states and local communities are using public funds to finance bikeways and bicycle parking facilities, and better bicycle facilities in turn are creating interest in the bicycle as a viable and nonpolluting, nonenergy consuming form of urban transportation.

As bicycles have increased in demand and sophistication, bicycle thefts have become a major consumer problem.

Since there are now numerous types of bicycles available at a wide range of prices, financial considerations are increasingly important in the public mind. As equipment becomes more complex and expensive, maintenance and quality of repair work also become important issues for the consumer of any age.

The Solutions

Solutions to these problems depend on many factors: Federal and state governments must promote balanced transportation by providing assistance for planning, developing, and financing of improved bicycle facilities; enact legislation of assistance to bicyclists; enforce bicycle manufacturing standards; and develop bicycle riding safety standards and regulations. Local governments must provide adequate and safe bicycle facilities; conduct bicycling safety education programs; and take steps to curtail bicycle theft. Citizens/consumers must become informed about bicycle safety laws and regulations and practice safe bicycling habits, and become informed about problems associated with bicycle purchase, maintenance and use and to participate in their solution. Finally, teachers must guide students to a better understanding of the importance of bicycle safety and the availability of adequate bicycling facilities. Classroom education and transportation consumer education can offer the student a unique opportunity to develop awareness and skills essential to acquiring responsible bicycling habits and to play a role in promoting responsible family and community attitudes toward bicycling.

This chapter focuses on developing consumer skills that are particularly appropriate for adults. The learning activities are designed to

- Develop awareness of and a positive attitude toward safe bicycling practices, even as an adult
- Stimulate a community-oriented concern to change the habits of people who ride their bicycles dangerously
- Develop wise purchasing skills, including the ability to effectively seek redress of grievances for unacceptable merchandise or repair work
- Motivate students to maintain their bicycles in safe operating condition and provide them with the necessary information to do so
- Encourage students to identify the need for bicycle facilities in their community and to promote their development

MINI-UNITS AND ACTIVITIES

Activity #	*Activity Description*	*Class Time (periods)*
	Mini-unit 14 Identifying and promoting safe bicycling practices	
48	The class discusses bicycle safety.	½-1
49	Students conduct scientific experiments illustrating bicycle safety concepts.	½-1
50	Students design and administer two polls: one to determine the public's attitudes toward and knowledge of bicycle safety; the other to learn the attitudes of automobile drivers toward bicyclists.	4-5
51	Students evaluate how to cope with friends and family members who ride their bicycles dangerously.	2
	Mini-unit 15 Studying how to buy and maintain a bicycle	
52	Students evaluate what bicycle characteristics purchasers should consider when deciding which bike to buy.	1
53	Students role-play scenarios involving bicycle purchasers and salespersons.	1
54	Students analyze bicycle warranties.	1-2
55	The class discusses bicycle maintenance and identifies methods for preventing bicycle thefts.	3-5
56	Students perform basic maintenance tasks on a bicycle in class.	1
	Mini-unit 16 Identifying when and how to seek redress of grievances	
57	Students identify and evaluate reasons for seeking redress of grievances and how redress should be sought.	2-3
58	Students role-play scenarios in which a consumer complains to a salesperson or mechanic.	1
59	Students form a committee to act as an ombudsman for bicycle-related complaints, mediating between cyclists and merchants or repairpersons in the local community.	1-2
	Mini-unit 17 Investigating bicycling in your community	
60	Students plan, engage in, and evaluate different recreational bicycle activities.	2-5
61	Students demonstrate in a series of experiments the potential use of bicycles for commuting.	2-3
62	Students evaluate needed bicycle facilities in the local community, such as bikeways and parking areas, and how to plan and advocate them.	1-2

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 14

IDENTIFYING AND PROMOTING SAFE BICYCLING PRACTICES

This mini-unit takes up safe bicycling practices--identifying them and pointing out why they should be followed.

There are a great many misconceptions about how to ride safely (for example, which side of the road to ride on) that need to be corrected. In addition, there are numerous bicycling hazards (such as sewer gratings) of which many bicycle riders--both new and old--are unaware. This unit seeks to dispel these misconceptions and point out these hazards.

However, many times people ride their bicycles dangerously even when they know how to ride safely. Often dangerous bike riding stems from some other cause such as habit, lack of time, peer pressure, and curiosity. This mini-unit also deals with these so-called affective causes of unsafe bicycling practices, making students aware of them and helping pupils to overcome them.

While it is essential that people know how to ride their bicycles in the safest possible manner, it is also important for people who are familiar with safe bicycle practices to urge others--friends, relatives, or neighbors--to ride *their* bicycles safely. The unit provides activities in which students can identify methods for promoting bicycle safety without seeming like busybodies or do-gooders. One approach the unit takes to achieve this goal is to involve students in role plays in which one person seeks to encourage another to adopt safe bicycling practices.

Finally, the unit involves students in examining the attitudes of automobile drivers toward bicyclists and makes the point that given the careless attitude of some drivers toward bicyclists, bike riders need to drive defensively to avoid injury.

Among the other key concepts addressed in this mini-unit the following are especially important:

- People need to consider whether they have a responsibility to encourage their friends and relatives to ride their bicycles safely.
- There are ways friends and relatives can encourage dangerous bicycle riders to ride safely.

- Bicycle safety rules--if followed carefully--can prevent serious bike accidents.

- Understanding of certain scientific principles, such as friction, inertia, etc., can help one understand the practical reasons for bicycle safety rules.

- Many automobile drivers see bicyclists as potential hazards on the road and feel that it is the bicycle rider's responsibility to avoid accidents.

MINI-UNIT 14 LESSON PLAN

Identifying and promoting safe bicycling practices

Activity #	*Activities*	*Class Time*
48	DESCRIPTION: The class discusses bicycle safety. GOAL: To know the potential hazards of bike riding, the rules that should be followed to avoid these hazards, and the reasons these rules have been made.	½-1 period
49	DESCRIPTION: Students conduct scientific experiments that illustrate bicycle safety concepts. GOAL: To know about scientific principles applying to bike riding and bike safety.	½-1 period, plus out-of-class time
50	DESCRIPTION: Students design and administer two polls: one to determine the public's attitudes toward and knowledge of bicycle safety; the other to learn the attitudes of automobile drivers toward bicyclists. GOAL: To be aware of local community attitudes toward and knowledge of bicycle safety and how these attitudes may affect bicycle safety.	4-5 periods
51	DESCRIPTION: Students evaluate how to cope with friends and family members who ride their bicycles dangerously. GOAL: To become familiar with why some people ride their bicycles dangerously and how friends and relatives can encourage them to ride safely.	2 periods

Total Class Time: 7-9 periods.

ACTIVITY #48

Mini-unit Topic: Identifying Safe Bicycling Practices

Approximate Class Time: ½-1 period

Capsule Activity Description: The class discusses bicycle safety.

Goal:

To know the potential hazards of bike riding, the rules that should be followed to avoid these hazards, and the reasons these rules have been made.

Concepts Treated:

- Careless bike riding can be very dangerous, leading to a wide variety of potentially serious--or even fatal--accidents and injuries.
- Bicycle safety rules--if followed carefully--can prevent serious bike accidents. Such rules include obeying normal traffic regulations, using or wearing special equipment, making an effort to concentrate on what the other fellow is doing on the road, and being sure to keep one's bicycle well maintained and in good condition.

ACTIVITY

Conduct a class discussion on bicycle safety. Such a discussion should consider the following topics.

Certain basic information about numbers, types, and causes of bicycle-related accidents in the United States is extremely helpful to know. For example, bicycle accidents cause the most injuries requiring emergency ward treatment each year (460,000); there are one million bicycle-related injuries a year, including 60,000 concussions and 120,000 fractures; bicycle accidents cause 1000 deaths a year--three a day; 20 percent of bike accidents occur in rural areas; approximately 26 percent of bike fatalities occur at night; two-thirds of bicycle deaths occur to children aged five to 14 years; bicyclists are not protected in spills or crashes, while auto drivers are. Additional safety information is provided in the Consumer Product Safety Commission report following the Variations and Supplementary Activities.

Major safety rules should be familiar to all: obey the laws; ride with the traffic [since riding against traffic can result in running into cars coming out of driveways and roads because auto drivers do not check for traffic coming down on the wrong side of the street; running into doors opened from parked cars for the same reason; running into cars on curves, since car drivers will hug the inner side of the road and cannot see a bike rider (nor can the bike rider see the car) until it is too late; and colliding with an automobile or other vehicle head-on, compounding the speed of the car and the bike if they collide]; do not speed--speeding makes it harder to avoid pedestrians, potholes, glass, sand, drains, and other vehicles; signal all turns, so that cars don't run into you as you turn; don't ride your children sidesaddle or on the handlebars; and don't weave in and out of traffic.

Special situations and equipment include using lights, reflectors, and light-colored clothing when riding at night (the French two-way armband light is especially good); slowing down in rainy weather to avoid skids (wet leaves are especially dangerous), since brakes, especially caliper ones (hand brakes) function poorly in wet weather; wearing protective helmet, particularly when riding on streets and highways; wearing clips over long pants to keep cuffs from catching in gears; making sure shoelaces are short for the same reason; avoiding traffic whenever possible; not riding two more more abreast on the road; not riding a bicycle that is too small or too large; when considering a bicycle purchase for a child, avoiding bicycles with high handlebars and small wheels--they are involved in a large percentage of accidents because they are less stable than other bicycles; and discouraging children from trying tricks such as "wheelies" (riding on the rear wheel only) and "jumpies" (slamming on the brakes so the bike will fly through the air).

Concentration while riding is important--watch for cars coming out of driveways and side streets and for sudden moves by pedestrians. During sunsets and rainy days, be especially careful of cars because they may not be able to see you. Listen for cars coming up behind you; look out for opening doors on parked cars; watch out for potholes, drains, sand, and glass; and be especially careful and observant at intersections.

Bicycle maintenance should not be neglected--see Activity 55, a class discussion on bicycle maintenance. Maintenance tasks include tire care, lubrication, tightening bolts and screws, adjusting brakes, and keeping bicycle dry and clean.

Registration of bicycles--in an emergency, a bike registration may help police to contact a relative. This may also help to recover a lost or stolen bike.

The Consumer Product Safety Commission Safety Standard should also be discussed--see the discussion of this safety legislation at the end of this activity.

Class discussion can follow on such issues as why many riders commonly ignore many of these safety rules and what can be done to encourage riders to practice these rules.

Evaluation Method:

Students develop a brief poll on bicycle safety procedures and administer it to other students or a small sample of the general public to determine the public's awareness of bicycle safety rules.

Variations and Supplementary Activities:

Having discussed the nature of bicycle safety, students can discuss what restrictions they would (or do) set for their children on riding bicycles. You can give the class a sheet instructing the students to set rules for a son or daughter regarding bicycle safety. A sample of what such a page might look like follows:

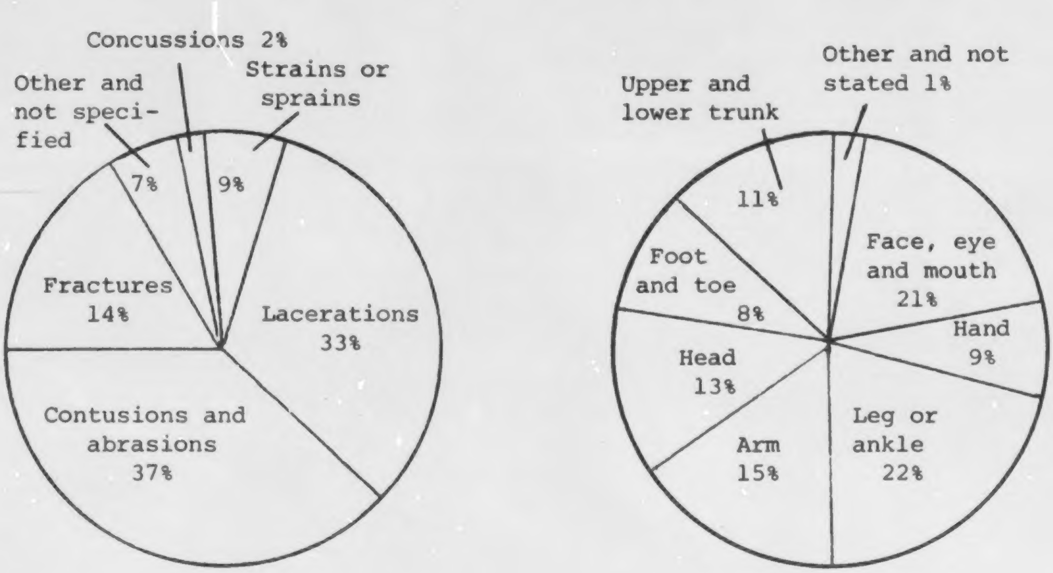
Safety Issue	*Son*	*Daughter*	*Penalty for Disobeying*
Riding at night without lights			
Riding "sidesaddle"			
Riding on busy streets			
Riding far from home			
Riding in the rain			
Fooling around--jumping the front wheel, etc.			
Riding in the middle of the street			
Riding "no hands"			
Riding through red lights			
Speeding			
Other (specify)			

After filling in the sheet the students can compare their responses in the light of their earlier discussions about bicycle safety. If students set different rules for sons and daughters, explanations for these differences should be presented. Students also indicate how they would explain these rules to their children.

Students can identify what they think are the most common cyclist traffic violations--many of which lead to accidents. The students' guesses can be compared to the finding of the National Safety Council which lists the most common cyclist traffic violations as follows (in decreasing order of frequency):

1. Riding in the middle of the street
2. Failure to yield right-of-way
3. Riding too fast
4. Disregarding traffic signs or signals
5. Riding against the traffic

Summary of NEISS Matrix Data on Bicycle Injuries
From Consumer Product Safety Commission



Type of injury

Body part injured

For 7/1/75 through 6/30/76 injury cases reported by the National Electronic Injury Surveillance System. Total bicycle injuries were 21,117 for this period.

During the 12-month period, July 1, 1975 through June 30, 1976, data on 21,117 injuries associated with bicycles were collected by the National Electronic Injury Surveillance System (NEISS). The majority (70 percent) of the victims suffered either lacerations or contusions and abrasions. Fractures were third, accounting for 14 percent of the injuries. There is broad distribution among body parts injured. Most (74 percent) of the injuries were to children under 15. However, injuries to bike riders over 15 occurred with frequency and severity sufficient to merit consideration. Twice as many males as females suffered injuries.

Reasons for accidents are similar for both sexes in all age groups. Losing control is one of the most common factors cited in bicycle accident investigations. However, in many cases, loss of control followed some other factor (such as riding double, stunting, and foot slippage) or resulted from poor design or component failure. The chart below breaks down bicycle injuries by age and sex as identified by NEISS.

Age and Sex Distribution

Age	*Percent*	*Sex*	*Percent*
0-4	12	Males	65
5-9	38	Females	35
10-14	33		
15-19	9		
20-24	3		
25-34	3		
35-44	1		
45-54	1		
55-64	1		
65+	Less than 1		

CONSUMER PRODUCT SAFETY COMMISSION STANDARD FOR BICYCLES*

The U.S. Consumer Product Safety Commission has published Federal safety regulations for bicycles to help insure safer performance and structural integrity. These regulations, issued under authority of the Federal Hazardous Substances Act, were published in their final form in the Federal Register of January 28, 1976. The regulations apply to all bicycles, both domestic and imported.

All provisions of the regulations are effective May 11, 1976, except for those requirements for chain guards and footbrake performance that become effective November 13, 1966. Any bicycle introduced into interstate commerce on or after May 11, 1966 that does not comply with the regulations is banned from sale in the United States.

The Federal Hazardous Substances Act also requires manufacturers, distributors, and dealers to repurchase banned products. The Repurchase Regulations specify how repurchase must be conducted and how purchasers must be notified of their right to have banned products repurchased. Bicycles introduced into interstate commerce before May 11, 1976, are not subject to repurchase.

Some major provisions of the bicycle regulations are as follows:

1. *No sharp edges and protrusions.* Sharp edges are prohibited, as are protrusions of specified dimensions.

2. *Good brakes.* The braking requirements depend upon the speed capability of each bicycle. Those bicycles capable of speeds equal to or greater than 15 miles per hour (many of these bicycles have handbrakes) must be able to stop in 15 feet from 15 miles per hour.

3. *Strong handlebars and handlebar stems.* The handlebar and stem must not break when subjected to specified strength tests.

4. *Strong tires and firmly attached wheels.* The tires must not blow off the rim when the tire is inflated to 110% of maximum recommended pressure.

5. *Strong forks and frames, and firmly-attached seats.* The front fork and frame must meet specified strength requirements. The seat must be firmly attached to the seat post tube so that it will not move or break under normal riding conditions, and it must not have any part or support over 5 inches above the top of the seat surface. This is to allow a rider to dismount by swinging a leg over the seat and rear wheel.

6. *Pedals.* Treads must be an integral part of the pedal construction, unless the pedals are intended for use only with toe clips (toe clips must be attached to these).

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*U.S. Consumer Product Safety Commission, *Technical Fact Sheet* (adapted). Washington, D.C. 20207

7. *Strong drive chain.* The drive chain must pass a strength test specified in the regulations, so that it won't break under normal riding conditions.

8. *Front, rear, side, and pedal reflectors.* All bicycles, except sidewalk bicycles, must be equipped with reflectors on the front, back, pedals, and sides. The regulations allow the bicycle to be equipped with either reflectorized tires or with reflectors mounted on the wheel spokes.

9. *Easy assembly and labeling.* Each bicycle must have an Instruction Manual attached to the frame or included within the package unit. If less than fully assembled, the bicycle must have instructions listing the tools necessary for proper assembly and adjustment, and illustrating the correct leg-length measurement of the rider. The bicycle instructions should be simple enough to enable an average person to properly assemble the bicycle.

10. *Other regulation requirements.* All bicycles, other than sidewalk bicycles, must pass a road test designed to simulate a bicycle ridden over a rough road. This test should expose potential problems with the bicycle.

BICYCLES: BUY RIGHT, DRIVE RIGHT*

Selecting a Safer Bike

Look Closely at All Potentially Sharp Edges

If you have a bike with sharp edges, file them down and cover them with heavy, protective tape. If this is done neatly, it will not detract from the appearance of the bike.

Look at All Parts of the Frame

Improperly welded joints or a fracture caused by improper handling in the manufacturing or shipping can result in a weak frame. Even a hairline crack can cause metal to break under a sudden jolt.

Watch Out for Protrusions Which Could Cause Injury to the Thigh or Groin

There should be no protrusions between the bicycle seat and handlebar stem that extend more than 3½ inches to the rear of the handlebar stem.

Faulty Brakes Can Cause Accidents

Always road test a bike before you buy. There is no other way to be sure the brakes are going to give you quick, smooth, easy stops. If you are buying a bike with handbrakes, be sure the levers can be moved easily. This is particularly important for children or others with small hands. If the bicycle has extensions on the handbrakes, they should give a full braking effect before the hand levers touch the handlebars.

Chain Guards are Very Important

Loss of control caused by clothing or shoelaces catching between the chain and sprocket can be especially dangerous. Be sure your bicycle has a chain guard unless the pedals can be rotated backward to release quickly any clothing that might get caught between the chain and sprocket. Leg bands or clips are an added protection for keeping clothing out of trouble.

Handlebars Should Allow Comfortable and Safe Control of the Bicycle

Handlebar ends should not be more than 16" above the seat surface when the seat is in its lowest position and the handlebar ends are in their highest position.

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*U.S. Consumer Product Safety Commission (adapted). Washington, D.C. 20207

The Bicycle You Select Should Be Visible From Every Angle

Your bike should have full reflectorization:

- Front reflector: colorless
- Rear reflector: red
- Pedal reflectors: colorless or amber
- Spoke reflectors: amber in front, red on rear wheel

The top of the rear reflector should be set at least 3 inches below the seat. Both the rear and front reflectors must be mounted straight so they reflect directly toward the eyes of a driver of an approaching car.

The center of each reflector mounted on the wheel should be within 3½ inches of the inside of the rim. Reflectorized tire sidewalls can be used instead of spoke-mounted reflectors.

Other good ideas include using a headlight and a taillight, sewing reflectorized tape on your driving clothes, or strapping front-back flashlights on legs and arms, so *you* and *your bike* are clearly visible to motorists.

Inspect Tires Closely

Tires have two important functions that contribute to the driver's safety. *The first* is to cushion the driver against potholes, rocks, and other rough places in the road.

The second is braking. Tires with good tread enable the driver to stop more quickly in an emergency.

Check for Two Types of Clearances

There should be at least 3½ inches of clearance between the pedal and the front fender or tire. This is important to prevent the toe of a shoe from getting caught between the frame and the front wheel. The pedals must not touch the ground when the bike is tilted at least 25 degrees on a turn. Otherwise, a pedal could catch the ground on a turn and cause a spill.

Avoid Equipment or Materials Which Rise More Than 5 Inches Above the Rear of the Seat.

These can interfere with the ability of the driver to dismount quickly and safely. It is also dangerous to carry passengers (including babies) on a bicycle.

Be Sure the Bike You Buy Is Firmly Assembled

Assembling a new bike should be done by an experienced person using the proper tools.

Do Not Buy A Bike That Cannot Be Adjusted to Fit

Improper fit can contribute to loss of control. The driver should be able to straddle the bicycle with both feet flat on the ground, and with no less than 1" clearance between the frame's top tube and the driver's crotch. Be sure you buy a bike that fits today, not one the driver will "grow into" later.

Tips for Safer Bike Use

Drive Near the Curb in the Same Direction As Traffic. Always Drive Single File

Competing with High Speed, Heavy Traffic is Dangerous

Look for safer, less travelled routes.

Stunting or Clowning on Bicycles Can Result in Serious Injury

Bikes provide fun, but safety must be taken seriously.

Be Alert to Surface Conditions and Traffic All Around You

Sewer grates, potholes, rocks, and other surface conditions can easily throw the most skillful drivers. Drive slowly enough to avoid unexpected obstacles, such as car doors suddenly opening, cars backing out of driveways or parking lots, or children unexpectedly running in front of the bicycle.

Riding in Wet Weather Is Hazardous!

Visibility is a problem--for cars and bicycles. Wet tires tend to skid, and wet handbrakes may not be effective. Going through deep puddles at high speed can cause loss of control. Avoid wet conditions if at all possible.

Keep Bike Tires in Top Condition

Tires are safer if properly inflated as recommended by the manufacturer. Under-inflated tires give poor protection. Over-inflated tires do not grip the road or street effectively when you apply the brakes. Tires with worn tread should be replaced.

Keep All Parts Properly Adjusted and in Good Operating Condition

"Wobbly" wheels may need to be aligned or spokes may require adjustment or replacement. Replace all missing, damaged, or worn parts such as chain links, screws and bolts, handlebar grips, seats, brake pads, and cables on handbrakes. If you are not familiar with proper bike maintenance, have these adjustments done by someone who has the right tools and know-how.

Know Traffic Laws and Signals

Most laws and regulations that govern auto traffic apply to bicyclists.

ACTIVITY #49

Mini-unit Topic: Identifying Safe Bicycling Practices

Approximate Class Time: ½-1 period plus out-of-class time

Capsule Activity Description: Students conduct scientific experiments that illustrate bicycle safety concepts.*

Goal:

To know about scientific principles applying to bike riding and bike safety.

Concepts Treated:

- Understanding of certain scientific principles (such as friction, inertia, etc.) can help one understand the practical reasons for bicycle safety rules.
- Under given circumstances that are explainable by scientific concepts, accidents may become unavoidable; it is therefore wise to understand the concepts, so that one may avoid the circumstances.

ACTIVITY

Students engage in one or more scientific exercises that illustrate bicycle safety concepts. Sample activities are discussed on the following pages. (Several of these activities require special rooms or equipment.)

Evaluation Method:

Students respond to your written or oral questions on what safety concepts the activities illustrate, and how they apply specifically to bicycle safety.

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*Experiments are taken from a *Teacher's Guide to Bicycle Safety Activity Projects* by the American Automobile Association.

Friction. Involve students in a science research project on friction. Assign different facets of the project to separate groups or teams. Some of the questions which they might investigate, report on and demonstrate include

- What is friction?
- How does friction make it possible to control a bicycle?
- What factors determine the amount of friction which is created between a wheeled vehicle and the surface or condition of the surface?
- What effect do bumps and hollows on the road surface have on braking?
- What causes a bicycle to skid?
- How does centrifugal force relate to friction in controlling a bicycle when turning?

Stopping Time. Ask students why it is impossible to stop a vehicle, automobile or bicycle "on a dime." Then ask them how far they think a bicycle travels from the instant the driver sees a hazardous situation (car door opening in front of him) until the bicycle can be brought to a full stop.

Estimates on required stopping distances will vary widely. Students will know that the faster a vehicle is travelling the more distance is needed to stop it. They may realize that the type and the condition of the road are also significant factors. Generally, however, students will underestimate stopping distance.

Students can be helped to derive the data on reaction intervals from their own computations. The reaction interval is approximately 3/4 of a second. Students can compute the distance travelled per second at varying speeds by deriving or simply using the formula:

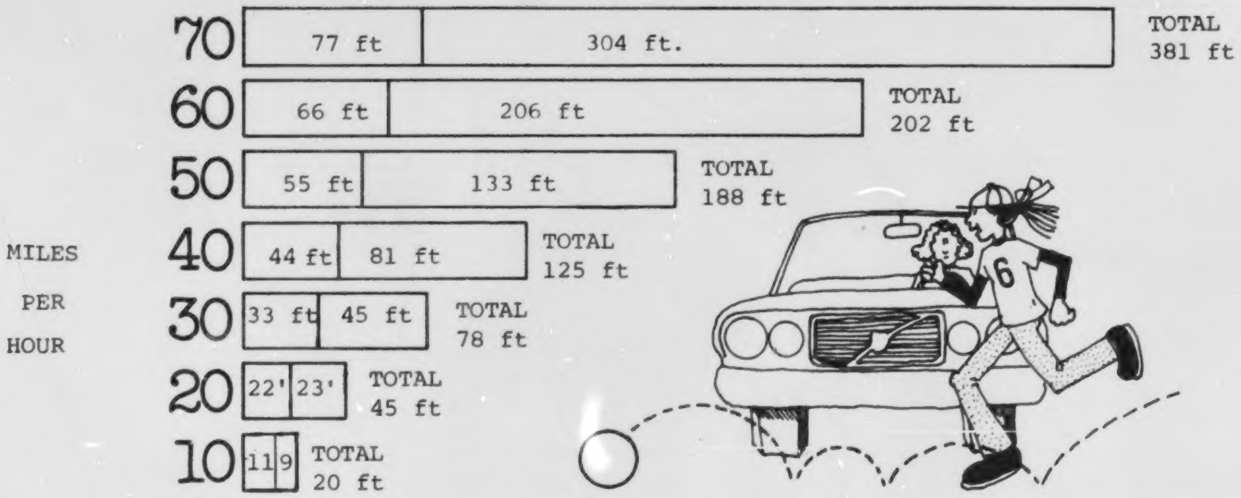
$$\frac{\text{Speed (in mph)} \times 5280}{3600} = \text{Feet per second}$$

Three fourths of the number of feet per second will be the distance travelled during the reaction interval.

Braking Distance. Students can estimate braking distance. Pass out the minimum stopping distance chart on the following page and have students determine the relationship between braking distances and speed of vehicles. Students may discover that "braking distances are about proportional to the square of the driving speeds." Once the ratio is found, give the class the braking distance at ten mph (nine feet), and ask them to approximate the distance at five mph.

Effect of Decreased Friction. The following demonstration measures the effect of decreased friction on driving control. Have a small student sit on a bicycle. Set the brake. (Two other students may be needed to help balance him.) Attach a large spring balance to

Minimum Stopping Distances



the rear wheel. Have a strong student pull on the balance to find the force needed to slide the rear wheel on the floor. Record the results. Repeat the demonstration after wetting both the wheel and the floor area. Record the results.

Reaction Time. The class can demonstrate that the fastest possible reaction time between the eye and the foot is 0.7 second. Fix two boards about a foot square so that they are exactly eight inches apart. A hole large enough for an ordinary marble to pass through easily is drilled in the top board. The marble will drop the eight inches in exactly 0.2 seconds. To try the experiment a person places his hand immediately under the hole, resting it on the bottom board. As soon as he sees the marble dropped, he is to remove his hand because the fastest possible reaction between eye and hand is always longer than that 0.2 seconds.

Night Visibility. Take the class into a room that can be darkened as completely as possible. If there are several rooms that are suitable, choose the largest one. Mark distances on the floor five or ten feet apart. First, select a student in dark clothes to go as far away as possible and then approach the group slowly. As soon as any student sees him, he should raise his hand. Mark on the floor the distance at which the student first becomes visible. Choose another student wearing some article of white clothing. Again mark the spot where the student becomes visible. Relate this study to the need to wear white when driving a bicycle at night.

Momentum. Once wheels have received the initial start they continue to roll. The harder the pedal is pushed on a bicycle the faster the wheels go; why is this?

On the playground, have a cyclist drive his bicycle at a moderate speed. Then tell him to take his feet from the pedals and coast until the bike stops. Let him try it again--this time from a slightly faster pace. Explain to the class that the act of coasting or rolling without mechanical help is due to momentum. The greater the speed, the more momentum and the harder it is to stop. Relate momentum to weight, as well, and point out the importance of understanding momentum to safe cycling.

"Force of Impact" Concept. Use two skates to represent cars of equal weight and have two students roll them gently toward each other. Class notes the force of impact when the skates collide.

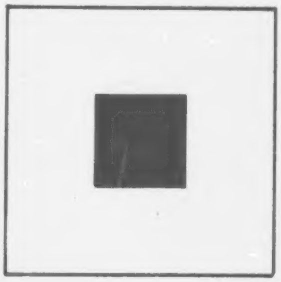
Now ask the students to roll them with greater force; the impact will be greater and will probably make the skates roll backwards. When the students push the skates at each other as hard as they can, the skates will push back with greater force and probably turn over.

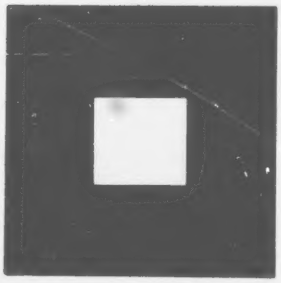
Compare this to cars going at high speeds and colliding on the highway. To measure the actual force of impact, it is necessary to consider the weight of the vehicles, the speed, and the distance traveled following the collision. If the speed is doubled, the force of impact is four times as great. Because the two skates are the same weight and traveling at approximately the same rate, they will receive the same shock of impact.

Rolling a toy car against one skate will demonstrate what a slim chance a small light car has against a big truck on the road. Students can then better visualize what a cyclist is up against if he should collide with a motor vehicle.

Why do Light Objects Look Larger than Dark Objects? When a ray of light strikes the light-sensitive elements within the eye, the effect of the light spreads out over a slightly larger area. When we look at a light object on a dark background, the image spills over into what should be a darkened portion of the retina. This makes light objects look larger to us. In reverse fashion, a dark object on a light background looks smaller than it really is because light from the background encroaches upon the darkened portion of the retina.

Cut identical small squares of white and dark paper. Place the white spot on the dark background the the same size dark square on the white background. Students note that the light piece on the dark background looks larger, indicating that white can be seen better than dark colors at night. Relate this to clothing and night-time cycling.





ACTIVITY #50

Mini-unit Topic: Identifying Safe Bicycling Practices

Approximate Class Time: 4-5 periods, plus out-of-class time

Capsule Activity Description: Students design and administer two polls: one to determine the public's attitudes toward and knowledge of bicycle safety; the other to learn the attitudes of automobile drivers toward bicyclists.

Goal:

To be aware of local community attitudes toward and knowledge of bicycle safety and how these attitudes may affect bicycle safety.

Concepts Treated:

- Community residents' attitudes towards bicycle safety and regulations may be affected by such things as bicycle ownership, age, sex, etc.
- Lack of knowledge about bicycle safety rules on the part of the automobile-driving public may lead to unsafe driving practices.
- Many automobile drivers do not understand the rules of bike riding or ways of dealing with bicycle riders while on the road.
- Many automobile drivers see bicyclists as potential hazards on the road and feel that it is the bicycle rider's responsibility to avoid accidents.
- Awareness of the attitudes of automobile drivers toward bicyclists may point out a need on the part of bicyclists to drive defensively when automobiles are around.

ACTIVITY

One half of the class draws up a poll to discover the community's attitudes toward and knowledge of bicycle safety rules and practices. Sample questions can include

- What side of the road should bicycle riders ride on?

- Must or should they stop at stop signs?

- Is it dangerous to ride on the handlebars of a rider's bike? Is it illegal?

- Is it safe to ride at night with a reflector? Is it legal to ride without a light at night?

- Is it necessary to ride a bicycle defensively?

- Is it unsafe to ride in and out of traffic even when it is not moving?

The group decides what relationships it wishes to study, such as age, sex, whether respondent rides a bike, and how often. Students decide to whom to administer poll and how. The group then tests the poll by administering it to the other class group and makes any necessary revisions.

After administering the questionnaire to members of the community, the group tabulates the results and analyzes the various relationships involved. The group prepares a report that evaluates the public's attitudes and information, presents it to the rest of the class and responds to comments and questions.

The other half of the class, while the first half is conducting its study of public attitudes toward bicycle safety, draws up a list of questions to ask automobile drivers about bicycling. The group gives the poll a dry run by administering it to friends or relatives. Sample questions can include

1. Have you experienced any problems driving when there are bicycles on the road?

2. What exactly have these problems been? For example, not seeing cyclists during the daytime? during the evening? having to slow down for bicycles? having to pull out of your lane to pass a bicycle? cyclists riding tandem? cyclists darting out at intersections, from between parked cars, or at intersections? cyclists riding on the wrong side of the road? cyclists weaving in and out of traffic? cyclists doing something unexpected, or seeming as if they were about to?

3. How do you feel these problems should be solved? For example, keep cyclists off the road? build more bike paths? arrest cyclists who are driving illegally? scare cyclists by riding close to them or honking at them?

4. Do you feel bicycles should (or do) have equal rights with cars on the roads? Why or why not?

5. Are you familiar with the rules which bike riders must follow in safe bike riding? For example, what side of the road should bicycle riders ride on? must or should they stop at stop signs? is it dangerous to ride on the handlebars of a bike? is it illegal? is it safe to ride at night with a reflector? is it illegal to ride without a light at night?

The students decide whom to interview (for example, classmates, teachers, friends, community residents). They also decide if they want to make correlations by whether respondents ride bicycles themselves sometimes or have children who do, or by age, sex, type of car driven, etc. The group then divides up responsibility for completing the interviews.

After completing the interviews, the group collates the results. Findings are analyzed in terms of how to educate auto drivers to be careful around bicycle riders and how bicycle riders should drive defensively to avoid accidents with automobiles.

The group prepares a report, presents it to the rest of the class, and responds to comments and questions.

Evaluation Method:

Students individually, in small groups, or as a class write letters to the editor of the local newspaper(s) or to appropriate government officials evaluating whether the state or local community should enact stronger bicycle safety laws, enforce existing laws more strictly, or maintain its present policies in these two areas.

Variations and Supplementary Activities:

The groups can write up their results into an article for submission to school and community newspapers.

Follow-up discussions can be held on what can be done about the community's ignorance of or inappropriate attitudes regarding bicycle safety, if such exist.

ACTIVITY #51

Mini-unit Topic: Identifying Safe Bicycling Practices

Approximate Class Time: 2 periods

Capsule Activity Description: Students evaluate how to cope with friends and family members who ride their bicycles dangerously.

Goal:

To become familiar with why some people ride their bicycles dangerously and how friends and relatives can encourage them to ride safely.

Concepts Treated:

- Even though many people know how to ride their bicycles safely, they often neglect to do so.
- People need to consider whether they have a responsibility to encourage their friends and relatives to ride their bicycles safely.
- There are ways friends and relatives can encourage dangerous bicycle riders to ride safely.
- In many cases, unsafe bicycle riding is not a matter of mere carelessness, but stems from some other "behavioral" cause such as haste, habit, the need to take risks, etc.
- For some people, knowing bicycle safety rules is not sufficient to make them ride carefully, although they might not consciously intend to break these rules.

ACTIVITY

Students begin this activity by role-playing scenarios in which one or more "members of the family" or friends ride bicycles. The scenarios involve safety issues that require resolutions. Sample role profiles are provided at the end of the activity, but the students should be encouraged to create their own role profiles.

After each role-play, nonparticipants suggest what they would have said and done had they been participants. Participants discuss the feelings they had while role-playing.

After the role-plays, list on the blackboard the ways students responded to each scenario. Then hold a class discussion on the response you and the students feel is most constructive for dealing with people who don't ride safely. Ask students if they have personally tried to encourage a friend or relative to ride his or her bicycle safely, how they tried to motivate him or her to do so, and what the results were.

During the following class session, conduct two follow-up activities:

Have the students *write brief (1/2 page) accounts* of things they personally have done or have seen others do in spite of the knowledge that these actions were clearly dangerous. Give one or two examples, such as overweight people eatting fatty foods in a restaurant, people smoking, or automobile drivers not wearing safety belts. Then break the class into small groups and give them written instructions to

1. Read each other's papers.

2. Go through the actions described and decide and record *why* these people might have done these dangerous things. Don't simply say "lack of will power" and leave it at that. Explain *why* they don't have the will power. Discuss what *other* reasons besides so-called lack of will power account for their behavior.

3. Decide and record which, if any, of these reasons might explain why some people ride bicycles in unsafe ways.

4. Decide and record if there are any *other* reasons people might ride unsafely, even when they know they are endangering themselves, such as when someone is late and in a hurry or trying to gain speed before a hill. Does the lack of enforcement of bicycle safety regulations have a negative influence on bicycling practices?

Groups report results to the class and respond to questions and comments from you and the class.

Reread the scenarios and ask students to play "Dear Abby" in responding to someone writing a letter about each of the family bicycle problems involved. The students remain in their small groups and select the letter written by one of their members which they feel is the best response to the scenario. The groups read the selected letters to the class and respond to comments and questions from you and the students. The class then selects one letter and sends it into the local newspaper "Dear Abby" section to compare their response with "Abby's."

Evaluation Method:

Students role-play or write the dialogue to a scenario in which a social worker is "consulted" by one of the family members in the scenarios.

Variations and Supplementary Activities:

New role profiles can be created by varying the age and sex of the riders, the unsafe activities they engage in, the availability of other forms of transportation, etc.

Students can role-play, a "hotline" to which family members call in problems about bicycle safety.

Sample Scenarios

Reckless Friend

Friend

Your best friend, who is also the star bowler on your local bowling team, rides home from bowling every week at break-neck speed, with no regard for traffic lights or stop signs. He rides on the wrong side of the road and pays little attention to where he's going. You're concerned about him because he's your close friend and also because if he gets injured your team will never win the championship. Today's game is over and you've decided to talk to him about his dangerous bicycle habits. You walk over to his locker where he's changing. What do you say?

Rider

You are the star of the local bowling team and expect the team will win the championship this season behind your leadership. Your other passion is bicycling. You have a ten-speed bicycle that you love to ride, even though you know at times you are reckless on it. But you know how to handle a bike with great skill and can take care of any emergency that might arise as you ride. You're changing now in the dressing room, and your best friend and teammate comes over to chat.

Dangerous "Leader"

Friend

Your best friend, Jose, is always riding his bicycle in dangerous ways, like riding on the wrong side of the street; racing through intersections, red lights, and stop signs; and weaving in between cars. You are both part of a group of friends and at times all of you are a bit reckless, but Jose is *always* reckless. The only way you can keep up with him is to ride in the same reckless way. What bothers you is that you've nearly been in an accident twice and not only are you scared of getting hurt, you can't afford to buy another bicycle if you wreck this one. Then you won't be able to ride with Jose at all. Jose has just come over to pick you up for an afternoon of biking, but you've decided to talk to him first about his reckless bicycling habits. What do you say?

Rider

Every weekend and often after work you and your friend, Harvey, go bike riding. You are sort of the leader of the group and you have your "reputation" to protect as the most skilled rider of the group. You know the others respect you for this and you like being leader. Besides, you can handle your bicycle better than they can--better than anyone in the neighborhood. You've just biked over to Harvey's to pick him up for today's outing.

Lights at Night

Friend

Your friend Marcia drives her bicycle at night without any lights on it. There is a small reflector on her rear bumper, but you know this isn't enough. Most automobile drivers either can't see it or might hit her by the time they do. This has bothered you for some time now and you've decided to talk to her about it. You're in a local sandwich shop (spa, bar, Dairy Queen, etc.) together having lunch (ice cream, a drink, etc.). What do you say?

Rider

You and your friend, Lorrie, are in the local sandwich shop (spa, etc.) having lunch (ice cream, etc.). Lorrie is a careful sensible person who doesn't do reckless things or take too many chances. You feel she misses out a lot in life by being so careful. Just looking at her right now you can tell she's going to warn you about something, like riding your bike at night with only a reflector or riding on the wrong side of the street.

Son and Daughter

Parent

You have two children, an 11-year-old son and a 13-year-old daughter. Both have bicycles. You let your son ride his at night because he's a boy and you feel he can take care of himself and can handle the bike pretty well. You feel your daughter, however, is liable to get hurt either by someone who might try to steal her bike or because she won't be able to handle the bike well and will get into an accident. But now you're all at the dinner table and your daughter is looking at you angrily.

Daughter

You are 13 years old and your younger brother is 11. Your parents let him ride on his bike at night, but they won't let you even though you're two years older. You feel this is unfair. Two of your girlfriends have invited you to go to a friend's house a mile away to watch television, but they're going by bicycle and you want to also. You are at the dinner table and ready to tell your parents to let you take your bike. What do you say?

Son

You are 11 years old and your older sister is 13. Your parents let you ride your bicycle at night because they know you can take care of yourself and can handle your bike well. You've never had an accident with it. Your parents won't let your sister ride her bike at night, but this makes sense to you because she can't handle her bike as well as you can. Besides, someone might come along and steal it away from her, and she wouldn't be able to stop them. You're at the dinner table enjoying a good roast beef.

Night Riding

Parent

You do not allow your son to ride his bicycle after dark because there is no light on the bike. You haven't bought a light for the bike because you've been using it as an excuse for not letting him ride at night. You feel night riding is dangerous even *with* lights. Your neighbor has just called up to tell you that he caught *his* son riding in town without lights along with *your* son who was using a friend's bicycle that also had no lights. You're angry as your son walks into the house from his ride. What do you say?

Son or Daughter

Your father (mother) won't let you ride your bicycle at night because it doesn't have a light on it. All your friends ride their bikes at night without lights and you can't see why you can't. It's not dangerous if you're careful, and none of your friends has been in an accident. Tonight a friend of yours suggested you ride to the Dairy Queen (movies, park, etc.) using his friend's bike. You agreed even though the bike had no lights because you would be laughed at if you refused. After the ice cream (movie, etc.) you left the bike off at your friend's house and walked home. You've just come in the house and you can see already that your father (mother) is mad about something.

Riding Double

Parent

You haven't been able to afford another bicycle for your daughter ever since her other one was stolen last month. What upsets you is that she has been riding around on the handlebars or side-saddle of other kids' bikes; it's very unsafe, particularly with all the traffic around your neighborhood. But you understand that it's hard for your daughter not to ride sidesaddle because she won't be able to play with her friends if she doesn't. But you feel she will just have to wait until you can afford another bike. Today you drove downtown on an errand and saw your daughter riding on the handlebars of a friend's bike. Now it is evening and she has just come home for dinner. She has disobeyed you and put herself in danger. What do you say?

Daughter or Son

Your bike was stolen a month ago and your parents say they can't afford to buy you another one yet. This makes it very hard for you to play with your friends because they all have bikes, and any-time they go somewhere the only way you can join in is to ride on someone's handlebars. But your parents have told you you are not allowed to do this--it's too dangerous, they say. This afternoon all your friends rode down to the movies (park, Dairy Queen, etc.) and you didn't want to be left out so you rode on Suzie's handlebars. Now you've just come home to dinner and you can see your parents (father) (mother) are upset about something. Did someone see you riding on Suzie's handlebars?

MINI-UNIT 15

STUDYING HOW TO BUY AND MAINTAIN A BICYCLE

This mini-unit provides students with information about what kind of bicycle to buy for their purposes, what size and model to purchase for their height, and how to ensure that the bicycle they buy is economical and reliable. In addition, the unit stresses that bicycle purchasers should have safety as well as economic, esthetic, and comfort considerations in mind as they decide what kind of bicycle to purchase.

However, knowing *what* to look for in a bicycle does not always ensure that the proper purchase is made. Emotional factors also play a part in influencing the interpersonal dynamics between customer and salesperson. The unit therefore also addresses such issues as customer embarrassment at examining the goods carefully before buying and coping strategies to use with high-powered salespersons who may pressure customers to purchase models or accessories they would prefer not to buy. This particular consumer skill is a valuable one that students can carry over to the purchase of *all* consumer products. Another consumer skill that is developed in this unit and which is also generalizable to the purchase of other goods and services is analyzing warranties and sales agreements.

This mini-unit also treats bicycle maintenance. Many people neglect to maintain their bicycles in top operating condition. Others would like to keep their bicycles in good shape but feel ignorant about how to do so or imagine the work required is too time consuming, complicated or messy. This mini-unit is directed toward all these individuals and will help them realize the importance of maintaining a bicycle and how to do so efficiently and easily.

The unit stresses not only that proper bicycle maintenance is necessary to provide maximum riding comfort and to preserve the life of the vehicle but also that maintenance is critical to ensure bicycling safety. Loose brakes, for example, can be as great a riding hazard as speeding.

Finally, this unit includes treatment of the issue of bicycle thefts--in particular, how to prevent them now that stolen bikes have become a major problem in America as the number of bicycle has proliferated and their value has soared.

Other key concepts this unit addresses are the following:

- The skills involved in buying a bicycle carry over to the purchase of all consumer products.
- The buyer should be sure that the store from which he buys is reputable and will give him good service in the future.
- Salespeople can often be extremely helpful when the person trying to buy a bicycle does not know what features he wants or what model would be best for him.
- Before purchasing a new bicycle, it is important to read the warranty to determine what it does and does not guarantee.
- Once the various tasks leading to safe bicycle maintenance have been learned, they are easy and not too time-consuming to perform on a regular basis.

MINI-UNIT 15 LESSON PLAN

Studying how to buy and maintain a bicycle

Activity #	*Activities*	*Class Time*
52 Spirit Master #8	DESCRIPTION: Students evaluate what bicycle characteristics purchasers should consider when deciding which bike to buy. GOAL: To know what factors should be taken into consideration in buying a bike, including the type of use to which the bike will be put, the most desirable style, the price, etc.	1 period
53	DESCRIPTION: Students role-play scenarios involving bicycle purchasers and salespersons. GOAL: To know how to deal effectively with salespeople when buying a bike.	1 period
54	DESCRIPTION: Students analyze bicycle warranties. GOAL: To know what one can and cannot depend on from a bicycle warranty.	1-2 periods plus out-of-class time
55	DESCRIPTION: The class discusses bicycle maintenance and identifies methods for preventing bicycle thefts. GOAL: To be aware of the types of owner activities important for bicycle maintenance and of the procedures for performing these tasks.	3-5 periods

MINI-UNIT 15 LESSON PLAN (CONTD.)

Studying how to buy and maintain a bicycle

Activity #	*Activities*	*Class Time*
56 Spirit Master #9	DESCRIPTION: Students perform basic maintenance tasks on a bicycle in class. GOAL: To be able to perform various bicycle maintenance tasks which they can then perform on their own bikes.	1 period, plus out-of-class time

ACTIVITY #52

Mini-unit Topic: Buying and Maintaining a Bicycle

Approximate Class Time: 1 period

Capsule Activity Description: Students evaluate what bicycle characteristics purchasers should consider when deciding which bike to buy.

Goal:

To know what factors should be taken into consideration in buying a bike, including the type of use to which the bike will be put, the most desirable style, the price, etc.

Concepts Treated:

- There are many questions that a person should ask him or herself before buying a bike, including what it will be used for, how much he or she has to pay, what kind of accessories are needed, what style of bike is most comfortable and reliable, etc.
- The decision to buy a bike is not the last step in bicycle purchase. The buyer should be sure that the store from which the bicycle is purchased is reputable and will give good service in the future.
- The final step in bike buying involves a careful check of the bike that is actually selected, including a test ride.
- The skills involved in buying a bicycle carry over to the purchase of all consumer products.

ACTIVITY

Students write responses to the following "letter":

Dear Consumer Hotline:

I need to buy a bicycle so that I can spent Saturday mornings riding around with my children. It's been years since I owned a bicycle and haven't kept up with the latest styles and features.

I plan to ride over somewhat rough terrain--over hills, up sidewalks, and so forth, trying to keep up with my kids. I'm also thinking of using it once in a while in good weather to ride to work and back, a round trip of about five miles.

I can afford to spend $115.00 for the bicycle. What kind should I get?

Sincerely,

Helpless

The following class session, students break into small groups and are given written instructions to discuss whether they disagreed on the type of bike Helpless should buy, and if so, why; agreed on what kind of bike he or she should buy and why; and decide, in general, how someone should go about assessing what kind of bike he or she should buy--what factors need to be taken into account, such as whether the purchaser plans to bike up steep hills, wants a rugged bike for dirt roads, will be exposing an expensive bike to theft risks, wants minimum upkeep costs, etc. Those students who have actually purchased bicycles can relate the criteria they considered in deciding what kind of bicycle to purchase and whether they regretted their selection or not--that is, were their criteria good ones? They can then discuss the extent to which the skills required to buy a bicycle, carry over to the purchase of all consumer products.

Groups report their conclusions to the class and respond to comments and questions from the class. Compile a list on the blackboard of purchase criteria the groups have come up with and try to gain a class consensus on what they should be--such as plans to bike up hills, plans to ride long distances, etc. You can also use the purchase consideration chart (Spirit Master #8) to summarize purchase criteria.

The following lists include steps in determining what kind of bike to buy, deciding where to buy the bike, and actually buying it. You might bring some of these up if the class fails to mention them. Steps to follow in deciding what *kind* of bicycle to buy include these:

1. Decide what the bike will be used for--short trips, long trips, commuting, recreation, up hills, over rough terrain, racing, touring, etc.

2. Decide how long the bike will be owned. This is a consideration in particular with bicycles for small children.

3. Select the brand of bicycle. It is useful to compare the repair records of various brands and models of bicycles.

4. Choose a style--racing, banana seat, conservative, etc.

5. Determine the number of speeds or gears--one, three, five, or ten--and how gear ratios influence hill-climbing capabilities.

6. Select handlebars--racing, conventional, or high rise.

7. Select price range--$50 to $100, $100 to $200, over $200.

8. Select proper size.

9. Determine the availability of replacement parts and services.

Three steps are involved in deciding *where* to buy a bike:

1. Compare bike prices in different stores, including any assembly charges.

2. Determine stores' reputations for selling quality products and making competent repairs.

3. Consider whether the bike should be bought from a store that can and will repair it competently and promptly.

Some of the steps involved in actually *buying* a bike include

1. Examine the tires--are they sew-ups or clinchers? Are they in good condition? (Clinchers are the most common and durable and the easiest to repair.)

2. Select the right size frame.

3. Test ride the bicycle.

4. Check the frame for defects and type of construction--welded or brazed. (In better bikes the frames are usually brazed. Welding, which is done at high temperatures, robs metal of its strength.)

5. Examine the warranty (see Activity #54).

Selecting *accessories* can be discussed in terms of why they are desired or needed--for safety, convenience, or aesthetic reasons. Examples of accessories include: lights (generator or lamp?) on the bicycle, worn on the rider, or both; locks; saddle bags, baskets, and book racks; tire pumps; tire pressure gauges; water bottles; gloves; kickstands; toe clips and pant-cuffs clips; chain shields that prevent trousers from getting caught in chains; child seats; tire-repair kits; cloth handlebar tape; car racks for transporting bikes; and bicycle safety flags for increased visibility.

Evaluation Method:

Students interview a local bicycle salesperson to find out what he or she feels a bike purchaser should consider in deciding what kind of bike to buy and in going about purchasing one.

Variations and Supplementary Activities:

Students can interview bicycle purchasers on how they decided what kind of bicycle to buy.

Students can interview bicycle salespeople on what kinds of bikes most customers buy and why.

Students can discuss and read about accessories they should or might want to buy.

Discussion can focus on what to examine in buying a *used* bicycle, such as condition of the frame, how well the gears work, presence of rust, tire condition, and number of accessories included.

Students can fill in a copy of the purchase considerations chart on Spirit Master #8 for their ideal bike and then discuss their selection criteria.

Students can role-play scenarios in which children want their parents to buy a bicycle for them. Sample role profiles for such simulations are provided on the following pages. After each role-play, students can discuss what kinds of features many children like in bicycles (e.g., banana seats), which of these features may be dangerous, and whether and how parents can discourage or prevent children from buying these kinds of bikes.

SAMPLE ROLE PROFILES

Ten Speed vs. Three Speed

Daughter

You are 13 years old and have outgrown your old bicycle. You want your parents to buy you a new ten-speed bicycle because they are more fun and easier to ride up hills. Most of your friends have ten-speed bikes, too, and you feel left out because you don't have one. You've just come in the house after tipping over on your old bike because it's too small for you. Your parents are in the kitchen having coffee. What do you say to them?

Parent

Your daughter has been riding around on a bicycle that she is getting too big for. You've been expecting her any day now to tell you she wants a fancy new bike. You feel that all she needs is a regular three-speed bike, even though you could probably afford a more expensive one. But she'll just outgrow this new bike in a couple of years, too, so why spend the money on an expensive bike now when she'll need another one in a few years? Your daughter has just come into the kitchen looking as though she wants something from you.

Replacing Old Bike

Son

You have a run-down bicycle that is bent out of shape and is almost impossible to ride. You have to walk it up hills it's in such bad shape. You've mentioned to your father several times that he should buy you a new bike, but every time you do he says, "We can't afford to buy a new bike just because your old one isn't perfect. Why, when I was your age (14) I never even had a bicycle. I walked everywhere I wanted to go." But last week your father bought a second-hand Buick Electra for $3200 when all he needed was a Ford or Chevrolet. And he says he can't afford a new bicycle, which would cost only $75! You've just come in from another rotten bike trip, and your father is sitting in the living room watching TV. You're ready to really put it to him. What do you say?

Father

Your son has complained to you several times that his bike isn't good enough for him; it's broken down and hard to ride. You realize it's not the best bike in the world, but it'll do for another year or so. Why does your son at age 14 need a fancy new bike for the short trips he makes? Besides, he'll just scrape and bang up a new bike and it'll look like his old one in two weeks. Anyway, you really can't afford a new bike. You have to make payments on the second-hand Buick Electra you just bought for $3200, so you're really strapped for money. At least you bought a good car that will last a long time and not cost you a lot in repairs. Your son has just come into the living room where you're watching TV. He looks pretty mad about something.

Which New Bike?

Son

You are 11 years old and really know how to enjoy life and impress your friends. But you've got this beat-up old bike that your friends make fun of and you hate to ride. ("Hey, Joe, you'd have to pay someone to steal that piece of junk!" they yell at you.) This morning, your best friend showed up at school with a brand new bicycle with a banana seat, high handlebars, a roll bar, and a five-speed stick shift. It made you feel awful. You've just come home now from school ready to *order* your father (or mother) to buy you one like your friend's. What do you say?

Parent

You have an 11-year-old son who is pretty wild sometimes, and you have to keep a sharp eye on him. Only last week he swore at a neighbor who was complaining that he and his friends were making too much noise playing stick ball in his back yard. You son has an old-fashioned bicycle with regular handlebars and thick tires. He's been pestering you to get him one of those new flashy bicycles that have banana seats, high handlebars, and five-speed stick shifts. You're afraid that if you get him one, he'll treat it like a racing motorcycle and go around doing all kinds of reckless things. Besides, it will probably get stolen in a week. So you have no intention of buying him that kind of bike, although you feel he may be ready for a new bike of some kind. Your son has just come home from school looking as though he wants to talk to you about something.

ACTIVITY #53

Mini-unit Topic: Buying and Maintaining a Bicycle

Approximate Class Time: 1 period

Capsule Activity Description: Students role-play scenarios involving bicycle purchasers and salespersons.

Goal:

To know how to deal effectively with salespeople when buying a bike.

Concepts Treated:

- Salespeople can often be extremely helpful when the person trying to buy a bicycle does not know what features he wants or what model would be best for him.
- In cases in which the purchaser knows the type of bike he desires, and has thoroughly researched his needs in a bicycle, he should not allow himself to be intimidated by a salesperson who appears to be knowledgeable.
- There are polite and effective ways of dealing with salespeople.

ACTIVITY

Students role-play scenarios involving consumers buying bicycles from salespeople. Sample role profiles are provided on the following pages. After each role-play, participants read their role profiles to the class and discuss the feelings they had while role-playing; in particular, "salespeople" discuss their emotional reactions to different approaches on the part of "customers" in terms of which approaches are most likely to result in salespeople being most helpful to the customer. Nonparticipants discuss what they would have said and done had they been involved. The class should be encouraged to write its own role profiles.

After completing the role-plays, the class discusses different approaches and responses used by purchasers and salespeople and decide which of these seemed to be most effective.

Evaluation Method:

Students compose the dialogue to one more scenario, writing the parts of both the customer and the salesperson.

Variation and Supplementary Activity:

Students can discuss embarrassment at carefully examining a bicycle for defects and characteristics before purchasing it. Students can brainstorm all the reasons a potential buyer might be embarrassed or nervous, such as concern about the salesperson getting angry; their revealing ignorance about the quality of the product, about what they wanted in the product, or about whether they really wanted to buy the product; other people waiting for service who might get angry at the delay, or other influences customers may have on a potential buyer; their need for the product, regardless of defects (e.g., because of the shortage of available bicycles); and not knowing what to do if a defect or missing part was discovered. Students can then identify methods customers can use to avoid feeling embarrassed or to become motivated to examine products carefully despite their embarrassment, such as knowing in advance exactly what to examine in a bicycle before buying; knowing exactly what kind of bike one wants to buy; planning in advance what to do if a defect is found, unwanted parts are present, or a desired part is missing (such as demanding a discount, a new product, or that the defect be repaired or the missing item included); identifying methods by which to exert influence over salespeople (such as asking for the supervisor, or indicating that you might shop at a competitor's store or write to the manufacturer or distributor).

Sample Role Profiles

Which Bike?

Purchaser

You want to buy a bicycle but you don't know whether to get a one-, three- or ten-speed or how much money to pay. You plan to use your bike for weekend trips of 5 to 15 miles, but that's about it. There's a small chance you might use it some days to commute to work, but that's not likely. You have come for advice to the Best Buy Bicycle Shop. You enter and go up to a salesperson. What do you say?

Salesperson

You work in the Best Buy Bicycle Shop. You sell all kinds of bikes. You want two things: lots of sales, preferably of expensive bikes, and satisfied customers. Sometimes you have to decide whether you want a satisfied customer buying a less expensive bike or an unhappy customer buying a more expensive one. A customer who looks very uncertain has just approached you. How will you handle his (her) questions?

Traditional or Sporty?

Purchaser

You want to buy a new bicycle for your 11-year-old son (daughter). He has outgrown his old bike and wants you to get him a fancy high-rise bike with a banana seat and stick shift. You think they're unsafe, too expensive, and don't last too long. Besides, your son will try to do all kinds of unsafe tricks and games on a high-rise. You want to get him a three-speed English bike that you feel is safer. You have decided to ask a salesperson for advice, taking your son with you. You both have just walked into the Swell Sales Bicycle Store and gone up to the salesperson. What do you say?

Son (Daughter)

You have outgrown your old bike and want your father (mother) to buy you a new, fancy high-rise bike with a banana seat and stick shift. That's the kind of bike all your friends have, and you like the looks of it. It makes you feel like you're riding a motorcycle--in fact, as soon as you're old enough and have the money, that's what you plan to buy. Your father doesn't like the high-rise bikes because he thinks they're poorly made and unsafe. You think they're as safe as any other bike. And besides, you really can't do as many tricks on an English bike as you can on a high-rise--although you can't tell your father (mother) that! You've just come with your father shopping for a bike.

You've both just entered the Swell Sales Bicycle Store and walked up to a salesperson. What do you say?

Salesperson

You are a salesperson in the Swell Sales Bicycle Store. You are an expert in children's bikes. It's so much fun when a parent and child come in looking for a bike and argue over what kind to buy. Usually, the kid wants the more expensive bike. But you have to watch yourself. If you side with the kid, the parent may get angry with you and buy the bike somewhere else. A parent and child are coming over to you right now. You wonder what kind of disagreement they'll have!

How Expensive?

Purchaser

You have decided to buy a medium-priced three-speed bike, for around $75. You want it to run errands and make short trips--nothing special. You walk into Rodney's Rugged Bike Shop to buy a Modesto Model 99Z. You walk up to the salesperson. What do you say?

Salesperson

You are a salesperson in Rodney's Rugged Bike Shop. You get a commission on every bike you sell--and the more expensive the bike, the larger your commission. In addition, you are tired of seeing customers buy what you feel are cheap, clumsy bikes when they could get a decent ten-speed for $125 or $175 and have a bike that will last and give a comfortable ride. Yet customers keep coming in asking for bikes like the three-speed Modesto 99Z, which sells for $70 when for only $50 more they could buy a ten-speed bike like the Superba XKG. A customer has just come into the store and comes up to you. How will you handle him if he too wants a bike like the Modesto 99Z?

Accessories

Purchaser

You want to buy a light for your three-speed bicycle because you've realized how unsafe it is riding at night without one. But you have no idea what kind of light to get--expensive or cheap, generator- or battery-powered, with reflectors or without, etc. You've just walked into Aaron's Accessories Shop and over to a salesperson. What do you say?

Salesperson

You work in Aaron's Accessories Shop and sell bicycle accessories like saddle bags and lights. You carry a complete line of items from cheap to expensive. Often customers come in and don't know what kind of accessory to get. You try to help them make a wise decision. Here comes a customer right now who looks as though he (she) needs some advice.

ACTIVITY #54

Mini-unit Topic: Buying and Maintaining a Bicycle

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students analyze bicycle warranties.

Goal:

To know what one can and cannot depend on from a bicycle warranty.

Concepts Treated:

- Before purchasing a new bicycle, it is important to read the warranty to determine what it does and does not guarantee in terms of repairs.
- Different bicycle manufacturers offer different kinds or amounts of service after purchase, and this should enter into one's decision concerning the type of bicycle to buy.
- The skills involved in analyzing bicycle warranties carry over to the examination of warranties for all consumer products.

ACTIVITY

You or your students bring bicycle purchase warranties to class. Students can bring in warranties on bicycles they may have purchased themselves, obtain them from bicycle and department stores, or ask salespeople what the guarantees are for the bikes they sell. Most warranties are contained in the bicycle service booklets that are distributed free.

The class then analyzes the warranties in terms of such questions as

- Are they "full" or "limited"? If they are *full*, this means defective products will be fixed (or replaced) free, including removal and reinstallation if necessary, within a reasonable time after you complain, and you will not have to do anything unreasonable to get warranty service (such as ship a piano to a factory). Also, the warranty is good for anyone who owns the products during the warranty period, and if the products can't be fixed (or haven't been after a reasonable number of tries), you get your choice of a new one or your money back. *Limited* warranties give you less than full warranties give. This means something is missing.

- Are all the parts of the product(s) covered by the warranties (or service contract)? Would the parts that are not covered be expensive to fix? Are they likely to break?
- Would you have to pay any of the repair costs?
- How long do the warranties last?
- Do you get a different amount of protection for different parts of the products? Or for different periods of time?
- Are the warranties for just the first purchaser?
- What do you have to do to get warranty service (such as mailing or shipping the product somewhere)?
- Do the warranties give any conditions for guaranteeing repair work, such as not abusing the bicycle or having it repaired only in certain shops?
- Do the companies giving the warranties have good (or bad) reputations for living up to their warranties?
- What services do the warranties not include that you would like to see in them?
- Is there any misleading information in the warranties that might lead a buyer to expect more than he will get?
- How good is a warranty if the dealer won't honor it?

Students clear up any uncertainties concerning what the warranties do and do not offer by talking with bicycle salespeople and reviewing the information about the warranty law provided at the end of this activity.

Students discuss personal experiences they may have had when attempting to have warranties honored and what they did if stores refused to honor them. Discussion can focus on the students' experiences with warranties on any products they have purchased, not just bicycles. Students identify the most effective ways to have warranties honored.

Evaluation Method:

During the course students read a warranty they have at home for a product they (or a member of their family) purchased and decide whether they are entitled to any free repairs or replacements. If they are, they take the product to the place of purchase and attempt to have the warranty honored.

Variation and Supplementary Activity:

Students write and compare their own ideal warranties and discuss with merchants any differences in what are included in the students' warranties and the merchants' warranties.

Is There a Law Covering Warranties? Yes!

It's the Magnuson-Moss Warranty Act, and it can help you get a good deal on warranties. The Warranty Act helps *before* you buy, by letting you see the warranties. Starting January 1, 1977, warranties on consumer products costing more than $15 must be available for you to look at before you buy--so you can comparison shop and get the best warranty. And, the Warranty Act helps *after* you buy, by making it easier for you to force companies to keep their warranty promises.

Some Basic Points

Under the Warranty Act, all warranties must be easy to read and understand. They must be written in ordinary language, not "legalese." Fine print isn't allowed.

Every term and condition of the warranty must be spelled out in writing. If it isn't there, it isn't part of the warranty.

Beward of spoken explanations of the warranty. What the salesclerk says about the warranty won't count when it comes time for warranty service. Check what's *written* in your warranty.

Note: the Warranty Act doesn't make a company give a warranty (though some state and Federal laws do require warranties on certain products). If you buy a product "as is," you will have to pay for any repairs.

The Difference Between Guarantees and Warranties

There are *no* differences--in the case of product warranties. "Warranty" and "guarantee" mean the same thing--a promise by a manufacturer or a seller to stand behind its product. But there is a *big* difference in the kinds of promises you can get.

What Kinds of Warranties Are There?

Written Warranties

There are two types of written warranties: *full* and *limited*. These words have been given special meanings by the Warranty Act.

Full Warranty. The label "full" on a warranty means all this:

- A defective product will be fixed (or replaced) free, including removal and reinstallation if necessary.
- It will be fixed within a reasonable time after you complain.
- You will not have to do anything unreasonable to get warranty service (such as ship a piano to the factory).
- The warranty is good for anyone who owns the product during the warranty period.
- If the product can't be fixed (or hasn't been after a reasonable number of tries), you get your choice of a new one or your money back.

Check if a warranty says "full"--it's a quick way to know if you're getting a lot of protection.

But there is one important thing the word "full" *doesn't* promise. A full warranty doesn't have to cover the whole product. It may cover only part of the product, like the picture tube of a TV. Or it may leave out some parts, like tires on a car. If your warranty covers only the picture tube and the sound goes bad, you pay. *Always check what parts the warranty ocvers.*

Limited Warranty. A warranty is "limited" if it give you anything less than what a full warranty gives. "Limited" means "be careful--something's missing." For example, a limited warranty may

- Cover only parts, not labor
- Allow only a pro rata refund or credit (you get a smaller refund or credit the longer you had the product)
- Require you to return a heavy product to the store for service
- Cover only the first purchaser
- Charge for handling

A product can carry more than one written warranty. For example, it can have a full warranty on part of the product and a limited warranty on the rest.

Implied Warranties

"Implied warranties" are rights created by state law, not by the company. All states have them.

The most common implied warranty is the "warranty of merchantability." This means that the seller promises that the product you buy is fit for the ordinary uses of the product. For example, a reclining chair must recline; a toaster must toast. If it doesn't, you have a legal right to get your money back.

Another implied warranty is the "warranty of fitness for a particular purpose." If you buy a product relying on the seller's advice that it can be used for a special purpose, then this advice may create a warranty. For example, a seller who suggests a certain sleeping bag for zero-degree weather warrants that the sleeping bag will be suitable for zero degrees.

Implied warranties come automatically with every sale, even though they are not written out. If a seller says nothing about warranties, you get the implied warranties. A seller can usually get out of these warranties by stating--*in writing*--that it gives no warranty at all ("as is"). But a seller can't give a written warranty and get out of the implied warranties. If you get a written warranty, you get the implied warranties too. The implied warranties may give you protection the written warranty doesn't give.

Service Contracts

Sometimes wrongly called warranties, service contracts are not warranties at all. Warranties come with a product at no additional charge. Service contracts give extra protection for an extra fee.

With a new product you usually get a written warranty and the implied warranties too. So compare the warranties and service contract carefully to see how much the service contract really adds.

Other Warranties

Spoken promises and advertising claims can be warranties too. You have a legal right to get what the company promises. These kinds of warranties are covered only by state law, not Federal law.

Consequential Damages

Normally, your warranty rights under all these warranties include the right to "consequential damages." This means the company must not only fix the defective product, but also pay for any damage the product did. If your freezer breaks down and the food in it spoils, the company must pay for the food you lost.

But a company can usually get out of this extra responsibility by saying in the warranty that it does not cover consequential damages. This can be done in both full and limited warranties.

Sometimes you will care more about the consequential damages than the product itself. If your car's antifreeze is faulty, and the engine block cracks, you may get back only the cost of the antifreeze. You should check if consequential damages are excluded, and think about how much damage the product can cause if it doesn't work.

If you are physically injured by a defective product, you usually have a right to get money from the company. See a lawyer about this.

If the Problem Isn't Solved

Your warranty rights don't run out at the end of the warranty for problems you complained about during the warranty period. The company must still take care of those problems, no matter how long it takes.

Here's what to do if you have trouble.

One. Make sure you have contacted the right person in the company. If the manufacturer gives a warranty, don't stop with the seller. Write (or call) the manufacturer at the address given in the warranty. Explain exactly what you think it owes you under the warranty--repair, replacement, refund, consequential damages.

Two. Contact a local consumer protection office or complaint center. It may be able to help you and tell you more about your rights. Check your phone book under the name of your city, county, or state government.

Three. In some cases there will be an organization which hears and decides disagreements informally, if both sides are willing. The company or a local consumer protection office can tell you who to contact. Check your warranty--this may be a required first step in solving the problem.

Four. If the amount of money involved is small, you can go to a small claims court. There costs are low, procedures are simple, and a lawyer is usually not needed. The clerk of the small claims court can tell you how to bring your lawsuit.

Five. If your product was manufactured after July 4, 1975, you can sue the company under the Warranty Act. If you win you can get money damages or any other type of relief the court decides to give you. This includes the cost of bringing the lawsuit and your attorney's fees.

If the product was manufactured before July 4, 1975, you can still sue the company under state law. You should contact a lawyer or consumer protection office for information.

Six. Report violations of the law to the Federal Trade Commission. The FTC *cannot* help you directly with a warranty problem. But it needs to know if companies are obeying the warranty rules. Write the FTC if a company does not make warranty information available.

How You Can Use Warranties

Read warranties before you buy to get the best deal. It may be worth it to pay more for a product with a better warranty. The extra money is like insurance--it protects you against the chance of a big repair bill. Comparing warranties now can save you money and headaches later.

Read the warranty when a problem comes up. The warranty is a contract that spells out your rights. Show the warranty to the company if it doesn't do what it promised.

Keep your sales slip with your warranty. You may need it to prove the date you bought the product, or that you were the original purchaser.

Remember to Check

- Is it "full" or "limited"? (Warranties only.)
- Are all parts of the product covered by the warranty (or service contract)? Would the parts that are not covered be expensive to fix? Are they likely to break?
- Would you have to pay any of the repair costs?
- How long does the warranty last?
- Do you get a different amount of protection for different parts of the product? Or for different periods of time?
- Is the warranty for just the first purchaser? Are you likely to sell the product, or give it as a gift, during the warranty period?
- What do you have to do to get warranty service? (Such as mailing or shipping the product somewhere.)
- Is there anything you have to do to keep the warranty in effect? (Such as proper maintenance.)
- Does the company giving the warranty have a good (or bad) reputation for living up to its warranty?

- What extra protection does the service contract give you that the warranties don't give?

- How much does it cost? Is it worth it?

- If you change your mind, or sell the product, and you want to cancel the service contract, can you get any of your money back?

- Who is responsible for performance? The manufacturer? The dealer? Someone else?

Note: The Federal Trade Commission enforces the Warranty Act. To report violations of the law write to the Federal Trade Commission, Warranties, Washington, D.C. 20580 or one of the addresses below. The FTC does not handle private cases, however. For copies of this pamphlet write to Federal Trade Commission, Legal and Public Records, Room 130, Washington, D.C. 20580. *Atlanta Regional Office,* 1718 Peachtree Street, N.W., Suite 1000, Atlanta, Georgia 30309 (404)881-4836; *Boston Regional Office,* 1301 Analex Building, 150 Causeway, Boston, Mass. 02114 (617)223-6621; *Chicago Regional Office,* Suite 1437, 55 East Monroe Street, Chicago, Illinois 60603 (312)353-4423; *Cleveland Regional Office,* Room 1339, Federal Office Building, 1240 East 9th Street, Cleveland, Ohio 44199 (216)522-4207; *Dallas Regional Office,* 2001 Bryan Street, Suite 2665, Dallas, Texas 75201 (214)749-3056; *Denver Regional Office,* Suite 2900, 1405 Curtis Street, Denver, Colorado 80202 (303)837-2271; *Los Angeles Regional Office,* 11000 Wilshire Boulevard, Room 13209, Los Angeles, California 90024 (213)824-7575; *New York Regional Office,* 22nd Floor, Federal Building, 26 Federal Plaza, New York, NY 10007 (212)264-1207; *San Francisco Regional Office,* 450 Golden Gate Avenue, Box 36005, San Francisco, California 94102 (415)566-1270; *Seattle Regional Office,* 28th Floor, Federal Building, 915 Second Avenue, Seattle, Washington 98174 (206)442-4655; *Washington D.C. Regional Office,* Gelman Building, 2120 L Street, N.W., Washington, D.C. 20037 (202)254-7700.

ACTIVITY #55

Mini-unit Topic: Buying and Maintaining a Bicycle

Approximate Class Time: 3-5 periods, plus out-of-class time

Capsule Activity Description: The class discusses bicycle maintenance and identifies methods for preventing bicycle thefts.

Goal:

To be aware of the types of owner activities that are important for bicycle maintenance and of the procedures for performing these tasks.

Concepts Treated:

- Regular bicycle maintenance is important for safe and enjoyable bike riding.
- Once the various tasks leading to safe bicycle maintenance have been learned, they are easy and not too time consuming to perform on a regular basis.
- There are actions which individuals can take to avoid or minimize the chances of theft.

ACTIVITY

This activity has three parts. In the first part, students interview bicycle riders (including each other) regarding bicycle maintenance; in the second, they discuss what maintenance tasks bicycle owners can and should perform; and in the third, they identify methods for preventing bicycle theft.

For the first part of this activity, break the class into small groups and have different groups interview bicyclists (including each other and members of the other groups who ride bicycles) and bicycle mechanics on various aspects of maintaining a bicycle. Sample questions groups interviewing bicycle owners might ask include the following:

- What are the two or three most common problems you have with the functioning of your bicycle?

- How do you take care of these problems? Do you fix them yourself? have a friend fix them? use a mechanic? just not fix them?

- What types of maintenance do you perform on your bicycle?

- If you do not perform all the standard maintenance tasks, why not?

- Do you feel regular maintenance helps prevent bicycle malfunctions?

Groups polling bicycle mechanics can ask the following questions:

1. What problems with bicycles are brought in to you that could have been prevented by regular maintenance?

2. What maintenance task could have prevented each type of problem?

3. Why do some people not perform these maintenance tasks?

4. What other maintenance tasks should the average bike owner perform, and how often?

5. How should a bike be stored in winter?

6. Are there any kinds of maintenance tasks which must be performed by a mechanic?

After conducting their interviews, groups report their results to the rest of the class and then, as the second part of this activity, engage in a class discussion to identify which basic maintenance tasks bicycle owners can and should perform. Such tasks can include

Tire care, including maintaining proper tire pressure (indicated on most tire sidewalls); being careful about filling tires with air, particularly with gas station pumps which can be inaccurate and cause tire explosions, not abusing tires by riding over curbs, riding double, and skidding to a stop; and not letting bicycles stand for any length of time on underinflated tires

Lubrication (according to bicycle manual instructions) of brakes, derailleur, chain, pedal, and other parts

Tightening bolts and screws periodically

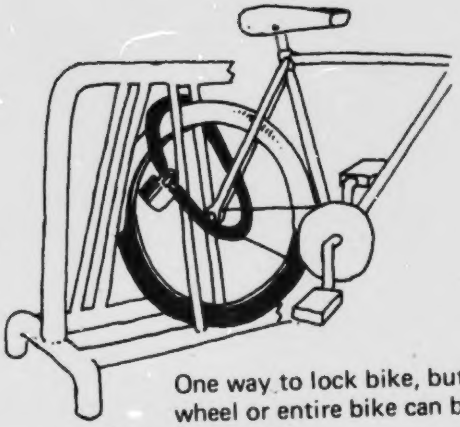
Adjusting brakes as they wear and loosen by turning appropriate screws

Keeping bicycles dry and free from mud

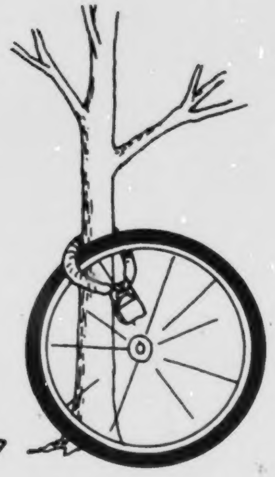
Follow-up discussion can center on reasons maintenance is important, such as making sure bicycle riding is as safe as possible (e.g., by having working brakes); making riding as easy as possible (e.g., through lubrication and proper tire pressure); ensuring a longer-lasting bike (e.g., by wiping it when it is wet); avoiding inconvenient equipment failures and breakdowns on the road (e.g., flat tires, lost bolts or screws); and maintaining resale or trade-in value. Conclude this second part of the activity by asking the class to identify reasons many bicycle owners are often reluctant to perform regular maintenance, such as laziness; not knowing that maintenance makes for safer and easier riding; and insecurity about how to do technical things like oiling joints and tightening screws and bolts.

For the third part of this activity ask the students to assume that each one has just had a bike stolen and has gone out and purchased a new one. Ask the students to discuss how they can be sure that this second bicycle won't be stolen. You can suggest methods the class fails to mention, such as

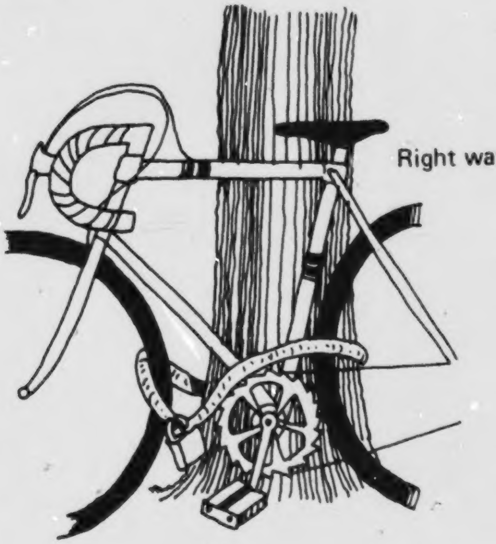
- Use a special kind of lock, such as the Kryptonite® bike lock designed by MIT students, or a heavy-duty tempered metal chain and lock. (Both can be found at most bicycle shops.)
- Lock the bike to a solid, immovable object.
- Pass the bike chain through both wheel and frame before locking it to a fixed object. (See the illustration on the following page.)
- Leave the bike within your view at all times.
- Ask someone to keep an eye on the bike while you are away.
- Remove the front wheel and lock it up too.
- Register the bike with the police to facilitate police identification if the bike is stolen and recovered. (In some communities bicycle owners must register their bikes with the police. What is the policy in the students' own community?)
- Keep a record of the bike's brand, model, number, and serial number.
- Consider adding the bike to your personal-property floater on your home-owner's insurance policy.
- Consider the purchase of bike theft insurance, sold by some local bicycle dealers.
- Park your bike in a "Rally Rack," a theft-prevention rack.



One way to lock bike, but front wheel or entire bike can be stolen leaving only



the wheel



Right way to lock bike.

Evaluation Method:

Students plan a presentation for elementary, junior, or senior high school students on how to maintain their bicycles or how to prevent bicycle theft and give the presentation in local schools or youth clubs.

Variations and Supplementary Activities:

Hold a class discussion on how to winterize a bike, including lubrication, leaving the bike upside down or hanging, treating the saddle with saddle soap to preserve the leather, cleaning and oiling all chrome parts and spokes, etc.

A trained mechanic can be invited to class to discuss how to take care of a bicycle.

Students can discuss dangerous riding locations and times where they might be jumped and robbed, such as parks at night.

Students can interview police officers about bicycle thefts and ask such questions as

1. How many thefts are there in our town a week?
2. Is the number going up, down, or remaining the same?
3. What kinds of bicycles seem to be stolen most often?
4. Why those kinds?
5. How many bicycles that are reported stolen are recovered?
6. What happens to stolen bicycles police find? How are owners located? What happens to them if their owners are not located?
7. What can bike owners do to prevent bicycle thefts?
8. Who steals bikes? Kids? Adults? Men? Women?
9. What do bicycle thieves do with bikes they have stolen?
10. What is the penalty for stealing bikes?

ACTIVITY #56

Mini-unit Topic: Buying and Maintaining a Bicycle

Approximate Class Time: 1 period, plus out-of-class training

Capsule Activity Description: Students perform basic maintenance tasks on a bicycle in class.

Goal:

To be able to perform various bicycle maintenance tasks which they can then perform on their own bikes.

Concepts Treated:

- Various bicycle maintenance tasks, although they may appear simple on the surface, in fact require practice to carry out well.
- Required bicycle maintenance tasks--or the way they should be performed--differ for various makes and models of bicycles.

ACTIVITY

The class divides into small groups, and each group is assigned or selects one of the following maintenance tasks: lubrication, tire care, tightening bolts and screws, adjusting brakes. Different groups can be assigned to work with different makes or models of bikes (e.g., racing, high-rise, one-speed), or all can work on the same type. Each group is responsible for learning how to perform its task well.* The groups get together after class to practice their tasks on a bicycle donated by a group member, friend, faculty member, or member of the community. After becoming proficient in its bicycle maintenance task, each group informs the teacher that it is ready to demonstrate the task to the rest of the class. On the same day or during different classes, the groups then perform their maintenance tasks in front of the class, explaining what they are doing in the process. Other members of the class ask questions and comment on the proficiency of the group demonstrating the task.

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*Groups should consult the Bibliography at the end of this chapter for sources of information on bicycle maintenance.

Evaluation Method:

Each group performs one of the maintenance tasks it did not present. The performance is then critiqued by the group whose specialty that task was.

Variations and Supplementary Activities:

Students who don't own bicycles can act as inspectors.

Students can use the inspection list provided on Spirit Master #9 for maintaining their own bikes.

A bicycle mechanic can be invited to class to evaluate each group's performance and to offer suggestions of his own.

MINI-UNIT 16

IDENTIFYING WHEN AND HOW TO SEEK REDRESS OF GRIEVANCES

This unit is designed to help students develop skills in determining when it is appropriate to complain about poor quality in the bicycles they buy or the repairs which have been done on their bicycles.

In addition, the unit promotes the development of positive attitudes toward redress of all consumer grievances--specifically, the attitude that there are both appropriate and inappropriate times and ways to complain about poor customer service.

The unit also stresses the need to become familiar with redress resources and to become active in communitywide efforts to improve *local* resources. For example, the last activity in the unit involves the class in forming a committee and acting as an ombudsman to mediate grievances between cyclists and merchants or repairpeople in the local community.

Among other key concepts the unit addresses are the following:

- Students need to become active in communitywide efforts to improve local resources designed to secure redress of grievances for consumers.
- When making a complaint to a bicycle merchant or repairperson, it is important to have all necessary papers (warranties, proof of purchase, etc.) on hand.
- In most cases, when presented with a well documented complaint, merchants will cooperate with the person making the complaint.
- There are certain accepted methods of seeking redress of grievance, and these are more likely to produce positive results.
- The redress one seeks should match the grievance (that is, one should not make unreasonable demands of the salesperson or manufacturer, since this might lead to *no* redress at all).
- Practicing seeking redress of grievances can facilitate such action when it proves necessary in real life.

MINI-UNIT 16 LESSON PLAN

Identifying when and how to seek redress of grievances

Activity #	*Activities*	*Class Time*
57	DESCRIPTION: Students identify and evaluate reasons for seeking redress of grievances and how redress should be sought. GOAL: To be aware of situations in which seeking redress of grievances is justified and ways in which redress should be sought.	2-3 periods
58	DESCRIPTION: Students role-play scenarios in which a consumer complains to a salesperson or mechanic. GOAL: To be able to seek redress of grievances effectively and appropriately for unsatisfactory purchases and repairs.	1 period
59	DESCRIPTION: Students form a committee to act as an ombudsman for bicycle-related complaints, mediating between cyclists and merchants or repairpersons in the local community. GOAL: To learn under what circumstances redress of bibicycle-related grievances is justified and under what circumstances the person seeking redress is likely to be successful.	1-2 periods

Total Class
Time: 4-6
periods.

ACTIVITY #57

Mini-unit Topic: Seeking Redress of Grievances **Approximate Class Time:** 2-3 periods

Capsule Activity Description: Students identify and evaluate reasons for seeking redress of grievances and how redress should be sought.

Goal:

To be aware of situations in which seeking redress of grievances is justified and ways in which redress should be sought.

Concepts Treated:

- Certain situations justify seeking redress of grievances, and certain others do not; one should be relatively sure that one is justified in seeking redress before "leaping into the fray."
- There are certain accepted methods for seeking redress of a grievance, and these are more likely to produce positive results.
- The redress which one seeks should match the grievance (that is, one should not make unreasonable demands of the salesperson or manufacturer, since this might lead to *no* redress at all).

ACTIVITY

A class discussion is held on reasons and methods for seeking redress of grievances concerning bicycle problems. The discussion can center on situations in which this is justified, how to seek redress, and the efficacy and ethics of different grievance actions.

Reasons for Seeking Redress of Grievances. The discussion should focus on two aspects of why to seek redress of grievances: specific causes for complaint (the grievance) and the objectives people expect to achieve by complaining (the redress). Specific grievances may revolve around such areas as purchase of defective bicycles or accessories; shoddy, delayed, or overpriced repair work on bicycles or accessories; unsafe bicycling conditions that may lead or already have led to accidents; lack of facilities for bicycles; and lack of means by which to seek redress of grievance. The types of redress sought can include repair of defective bicycles or accessories at no additional charge; injunctive relief against misleading advertising; punitive damages for dishonest sales methods, shoddy materials, or shoddy repairs; provision of an entirely new bicycle or accessory to replace a defective one at no extra charge; reduction in repair charges; provision of safe community bicycling facilities; elimination of unsafe community bicycling obstacles; and provision of means by which to easily and effectively obtain redress of grievances.

You should provide examples of how specific grievances and appropriate redress objectives are related. For example, if a bicycle shop performs shoddy repair work, what *specific objectives* can and should a consumer seek to redress that grievance? no charge for faulty repair work? correction of the problem at no further charge? Point out that how one obtains redress of grievances depends on what one's *objectives* are in seeking redress. If one wanted punitive damages for misleading advertising, one would use different means for redressing this grievance (e.g., court action) than if one simply wanted to exchange a bike for a different one (e.g., complaints to the management). In other words, there are three elements that must be examined: the grievance (e.g., shoddy repairs); the objective in seeking redress (e.g., free correction of the faulty repairs); and the methods by which to achieve the redress (e.g., writing the Better Business Bureau).

There are two steps in obtaining redress of grievances. The first is *identifying who has the power to redress the grievance*--that is, who is in a position to refund the consumer's money to make the bike repair correctly or who is in a position to force the merchant or repairperson to redress the grievance. Possibilities include the salesperson, the store manager, the courts, the Better Business Bureau, and many other individuals and groups. Once individual(s) or groups have been identified who can redress the grievance, the consumer must decide *what methods should be used* to encourage or force the targeted person or group to redress the grievance.

Methods for Obtaining Redress of Grievances. Methods that can be presented include complaining to the salesperson or management in person, by telephone, or by writing personal, return-receipt-requested letters; refusing to pay for a new or repaired bicycle or accessory, or if payment has already been made by check, stopping payment and phoning, writing to, or meeting with appropriate consumer protection, business, and legal agencies, such as

> U.S. Consumer Product Safety Commission, Washington,
> D.C. 20207 or its field offices in New York City,
> Atlanta, Chicago, San Francisco, Los Angeles,
> Boston, New Orleans, Kansas City, Philadelphia,
> Seattle, Denver, Minneapolis, Cleveland, and Dallas.
> Toll free number: 800-638-2666; Maryland only:
> 800-492-2937

Federal Office of Consumer Affairs, Department of Health, Education and Welfare, Washington, D.C. 20201

State county, and local consumer protection agencies, many of which are housed in the District Attorney's office (addresses and phone numbers can be obtained by asking the telephone operator for information)

Local chambers of commerce: address and phone numbers can be obtained from telephone directory or from Chamber of Commerce of the United States, 1615 H Street, N.W., Washington, D.C. 20006

Local Better Business Bureaus: addresses and phone numbers can be obtained from the telephone directory or from Council of Better Business Bureaus, 1145 19th Street, N.W., Washington, D.C. 20036

One can also use small claims courts, legal aid agencies, and neighborhood legal services. Help can be requested from appointed and elected officials; owners, managers, and central offices of stores that are part of a chain of stores or from local newspapers' action lines. Other possibilities include asking local media to publicize complaints in letters to the editors, articles, phone calls to talk shows, etc.; demonstrations, such as bike-ins, rallies, and picketing; and independent activities, such as creating road signs, developing bikeways, and opening up one's own bike repair shop.

Follow-up discussion on redress of grievances can center on such issues as

- Which methods of redress are legal?
- Which methods that are not illegal are nevertheless unethical?
- Is it ever permissible to use unethical methods when they are the only ones that may be effective?
- When is seeking redress of grievances not worth it because it involves too much time and effort?

During the following class session, students break into small groups and respond to scenarios concerning grievances over faulty repair work or defective purchases. Each group is given three scenarios of possible grievances. Sample scenarios are provided at the end of this activity. Each group is given written instructions to

1. Carefully read the first story you have been given.
2. Decide and record whether you consider what happened to be unfair and why.

3. If you decide that what happened was unfair, discuss and record what you want to see done. For example, do you want your money back?

4. Then discuss and record exactly what you will do to get the salesperson to comply with your wishes and explain why you chose that course of action.

5. Repeat Steps 1 through 4 for one or more of the other stories.

The groups then report their results to the class and respond to comments and questions from you and the class. You may want to make explicit the criteria by which consumers decide or should decide whether to seek redress of grievances (e.g., they have a legitimate complaint; seeking redress will not involve too much time, effort, or money; seeking redress will be effective) and which courses of action to choose to redress the grievance (e.g., on the basis of efficacy, morality, and costs in terms of personal time, money, and effort expended).

Evaluation Method:

Each student identifies a grievance he or she has regarding any product or service he or she has purchased recently and seeks to obtain redress. Students report their experiences to the rest of the class and evaluate them in terms of their earlier discussion on methods for seeking redress.

Variation and Supplementary Activity:

Students can poll bicyclists on complaints about their bicycles and what, if anything, they did about their grievances. Sample questions they can ask include the following:

1. When you bought your bicycle, did you have any complaints about the way it worked?

2. If so, what specifically were your complaints?

3. What, if anything, did you do about your complaints?

4. Were you successful in your efforts to seek redress of grievances? Why?

5. Have you had repair work done on your bicycle, and have you had any complaints about it? (Repeat second, third, and fourth questions.)

After conducting the poll, the class analyzes its results in terms of whether bicycle users and purchasers have common grievances; what these grievances are (unkept guarantees, shoddy repair work, delays in repair work, defective purchases); what consumers tend to do about these grievances; why consumers fail to seek or are unsuccessful in obtaining redress of their grievances; and how bicycle owners can be assisted in their efforts to obtain redress for their grievances.

Sample Scenarios

Faulty Warranty

You have just bought a new $234 racing bike from Zooey's Department Store. You took it out for its maiden ride and the rear derailleur broke. You go home and look up the warranty. It says that Zooey's will replace any defective parts during the first two months but will charge for any labor. You take the bike in and Zooey's tells you the labor will probably cost about $25 and it will take them about five weeks to get it repaired because they have to send it back to the manufacturer who has a lot of other bikes to repair before yours. The salesperson at Zooey's tells you that you could take it to a bike repair shop for faster service, but they will charge you not only $25 labor but $35 for a new derailleur. What, if anything, do you do?

Faulty Repair

One of your brake cables broke, and you have just had your bike repaired at Bibby's Bicycle Shop for $7.50. You check the brakes in the store, and they seem O.K. But the next Saturday when you go out riding, the same cable breaks again! You take the bike back to Bibby's, and the salesperson tells you it'll cost you $12.50 for a new cable and labor. You suspect that Bibby tried to do a quick patch-up job on your brake before, and since it didn't work, he's now going to do it right. But in the meantime, you have made a second trip, and your original $7.50 is down the drain. What, if anything, do you do?

Faulty Bike

You bought a new bike and rode it a few times, but the brakes just didn't seem as good as they should be. When you used them, your bike didn't stop as sharply as you wanted or thought it should. You didn't really know whether this is just the way bike brakes work or whether it's because they aren't working properly. So you had two of your friends ride your bike, and they told you that you were absolutely right: the brakes aren't any good. Since you have a warranty that says Bumble's Bicycle Shop, where you bought the bike, will repair anything that goes wrong in the first 90 days, you took it back to them. But the salesperson told you there was nothing wrong with the brakes. "What do you expect for an $85 bike? Instant action?" he said. He refuses to repair them, saying there's nothing he can do. What, if anything, do you do?

Faulty Accessory

You just bought a new $12.50 Whopper bicycle light at Arlo's Accessory Shop for your bike so you could ride more safely at night. On your second night out, the light stops working. You take it back to Arlo's but Arlo tells you he can't refund your money (it's against company rules) and that's the last Whopper bicycle light he has in stock. He'll be glad to exchange your Whopper for a cheaper Whimper light, but you know the Whimper is worth only about $3.50. This means you lose $9.00 on your original purchase. What, if anything, do you do?

ACTIVITY #58

Mini-unit Topic: Seeking Redress of Grievances **Approximate Class Time:** 1 period

Capsule Activity Description: Students role-play scenarios in which a consumer complains to a salesperson or mechanic.

Goal:

To be able to seek redress of grievances effectively and appropriately for unsatisfactory purchases and repairs.

Concepts Treated:

- Certain methods for seeking redress of grievances are more effective than others.
- The redress which one seeks should match the grievance.
- Practicing seeking redress of grievances can facilitate such action when it proves necessary in real life.

ACTIVITY

Students role-play customers seeking redress of grievances from bicycle repairpeople or salespeople who, according to these "consumers," have engaged in unfair business practices. Sample role profiles are provided at the end of the activity.

After each role-play, participants read their role profiles to the class and discuss the feelings they had while role-playing; in particular, "salespeople" and "mechanics" discuss their emotional reactions to different approaches on the part of "customers"--which approaches made them more likely to be firm and which approaches inclined them to make concessions. Nonparticipants discuss what they would have said and done had they been involved. The class should be encouraged to write its own role profiles.

After completing the role-plays, list on the blackboard the possible responses that salespeople and mechanics can offer to justify their positions and the possible approaches consumers can use in seeking redress of grievances.

Evaluation Method:

Students compose the dialogue to one or more scenarios, writing the parts of the customer and the salesperson, and then role-play them.

Variation and Supplementary Activity:

Students can practice writing letters of complaint concerning grievances they have about bicycle purchase or repair. Follow-up discussion can focus on how useful letter writing is; who the best targets are for writing letters; whether letters are more effective if they are angry, factual, apologetic, etc.; and what information should be included (such as writer's name and address; name of bicycle shop and its address; make, year, and number of model; description of the complaint; copies of repair, purchase, or warranty papers; conduct of the salesperson dealt with; and an indication that copies are being sent to other people). Sample agencies, individuals, and groups to which to write letters seeking redress of grievances include

1. Bicycle manufacturers or distributors (check bike manual or call bike store)

2. Consumer Product Safety Commission: to report safety defects or bicycling injuries, use toll-free phone number: 800-638-2666 (in Maryland only: 800-492-2937)

3. National Highway Traffic Safety Administration (for help with safety guidelines, not warranties or redress)

   Administrator
   NASSIF Building
   400 7th and D Streets
   Washington, D.C. 20590

4. Federal Trade Commission (if the company engages in interstate commerce and the complaint alleges false advertising or restraint of trade)

   Chairman
   Washington, D.C. 20580
   or regional offices in Atlanta, Boston, Chicago,
   Cleveland, Kansas City, Los Angeles, New Orleans,
   New York, San Francisco, Seattle (consult a
   local phone book)

5. Voluntary consumer groups. For names of local organizations write

Executive Director
Consumer Federation of America
Suite 1105
1102 14th Street
Washington, D.C. 20005

6. State and city consumer protection agencies (consult a local phone book)

7. Newspaper action lines (call local newspapers)

8. Better Business Bureaus (consult a local phone book)

9. Federal Congressmen (House of Representatives, Washington, D.C. 20510) and Senators (U.S. Senate, Washington, D.C. 20510) to recommend Federal legislation

10. State and local governmental representatives, governor, mayor, etc. (call information for addresses)

11. Foreign embassies (for bikes manufactured abroad; consult a local phone book)

A sample letter from a consumer registering a grievance to a salesperson follows.

Ms. Sarah Rizzo
President
Spoke Bicycle Company
Transit, Pennsylvania 00000

Dear Ms. Rizzo:

On April 1, 1976, I bought a Loser XKE bicycle from Larry's Bicycle Shop on 50 Main Street, Boston, Massachusetts. With the bike came a year's guarantee on parts and labor. However, two weeks after I bought it, the shifting mechanism broke. I took the bike back to Larry's Bicycle Shop, but he told me I would have to pay for the repairs because it was my fault the mechanism broke. He claims I must have let the bike fall over on it. This isn't true. It broke while I was riding up a hill. I insist on having the warranty honored. I hope you will take prompt action to remedy this unethical behavior on the part of Larry's Bicycle Shop.

I enclose copies of my sales receipt and the manufacturer's guarantee. Thank you for your attention.

Sincerely,

Paul O'Reilly

cc: Mass. Consumer Protection Agency
Boston Better Business Bureau

Sample Role Profiles

Faulty Accessory

Customer

Last week you bought a Whimper bicycle light for your bike for $3.50 at Arlo's Accessory Shop. The second time you used it, the on-off switch broke off. It's not something you can repair. You need a new light. You are angry and have taken the light back to Arlo's and walk up to him to demand he give you a new light for nothing or give you your money back. What do you say?

Salesperson

You work in Arlo's Accessory Shop. Most of the bicycle accessories you sell are cheap, but most of your customers don't want expensive bicycle lights, saddle bags, horns, and so on. The problem is that many of the accessories you sell break pretty quickly because they're so cheaply made. It's store policy not to refund money on any sales or to exchange anything, so it's sometimes a problem when someone comes in the store with an accessory that broke quickly and he wants his money back. In fact here comes the customer who bought your last Whimper bicycle light last week. He looks angry. It must have broken already. Why didn't he (she) buy the more expensive Whopper light as you had suggested. Although the Whimper light is only $3.50 and the Whopper light is $12.50, the Whopper light wouldn't break. Well here comes the complaint.

Faulty Warranty

Customer

You bought a new $234 racing bike from Zooey's Department Store. You took it out for its maiden ride and the rear derailleur broke. You went home and looked up the warranty. It says that Zooey's will replace any defective parts free during the first two months but will charge for labor. You take the bike into Zooey's and speak to the salesperson. You are about to tell him the problem and ask him to repair or replace the derailleur for nothing since it's in your guarantee. You also want him not to charge you for the labor, even though that's not in the guarantee. You step up confidently to him. What do you say?

Salesperson

You sell bicycles in Zooey's Department Store. However, your store doesn't repair bikes. It sends them out to be repaired and this usually means it takes about five weeks to get a bike repaired for a customer. You don't like this policy because customers get angry at you and your salary depends on how many bikes you sell. The more you sell, the higher your salary. And the more angry customers you have, the less likely they are to buy any bikes from you in the future. But it's the store policy and you feel stuck with it. In fact, here comes an angry-looking customer with a bicycle you remember selling him only last week. You remember that this particular model has been having trouble with the derailleurs--and it costs $25 in labor to have them fixed, although the warranty does guarantee that there is no charge for the part. Oh, oh! Here comes what looks like another angry customer with a broken derailleur!

Faulty Repair

Customer

You had your brakes repaired on your bike last week in Bibby's Bicycle Shop and it cost you $7.50. One of the cables had broken. Only yesterday the same cable broke again! You are furious and have taken the bike back to Bibby's ready to demand that he repair it for nothing--no parts or labor charges--and guarantee it won't break again. The repair person has just finished waiting on another customer. You walk over to him (her). What do you say?

Repairperson

You are the repairman in Bibby's Bike Shop. You feel you are good at your job, but of course sometimes you don't do such a great job making repairs--you have so many to do and the owner, Mr. Bibby, wants you to get as many done as you can. Sometimes, too, you have to work with bikes and materials that aren't that great--they aren't made well or they break easily. Right now, as you deal with one customer, you notice a customer whose brake cables you repaired only last week bringing his bike back into the store and you can see the broken brake cable across the store. You charge $7.50 ($4.00 labor and $3.50 for parts) for fixing brake cables but you know this customer is probably going to want you to fix this cable free. How are you going to solve this problem? Mr. Bibby doesn't like you to do repairs for nothing, even when the problem was your fault. But it wasn't even your fault, necessarily. Maybe the cable was a lousy cable to begin with. You're just finishing up with your customer and this customer with the broken cable walks over to you.

ACTIVITY #59

Mini-unit Topic: Seeking Redress of Grievances

Approximate Class Time: 1-2 periods, plus out-of-class time

Capsule Activity Description: Students form a committee to act as an ombudsman for bicycle-related complaints, mediating between cyclists and merchants or repairpersons in the local community.

Goal:

To learn under what circumstances redress of bicycle-related grievances is justified and under what circumstances the person seeking redress is likely to be successful.

Concepts Treated:

- In some cases, the cyclist/customer may in fact be wrong, seeking redress of an unjust grievance.
- When making a complaint to a bicycle merchant or repairperson, it is important to have all necessary papers (warranties, proof of purchase, etc.) on hand and to have organized all of the aspects of the complaint in one's mind before approaching the merchant or repairperson.
- In most cases, when presented with a well documented complaint, merchants will cooperate with the person making the complaint.
- Students need to become active in communitywide efforts to improve local resources designed to secure redress of grievances for consumers.

ACTIVITY

Students form a committee to act as an ombudsman for bicycle-related problems, mediating between cyclists who come to them with complaints about purchases or repair work and salespeople or repairpeople who made the sales or repairs.

Once the committee has been formed, the group advertises its availability to classmates, the school, and the community by word-of-mouth, newspaper notices, class presentations, or radio spot announcements.

The group also explains its objectives and reasons for organizing to the appropriate local merchants, making it clear that it is not a "vigilante committee" but rather a mediating group.

For each complaint, the committee questions the consumer to obtain all relevant information, such as dates (of purchase, of problem occurrence), warranties, prior experience with the merchant, and nature of the complaint; informs the consumer that the committee does not guarantee any results, nor does it necessarily have to agree with the consumer's position; decides how it will handle the case--what redress it should seek, how it should go about seeking redress, and whether the committee should act as a group, with or without the consumer, or designate one of its members to take the agreed-upon action; and reports the results of each procedure to the class for evaluation and questions.

Evaluation Method:

Students follow up the work of the committee by interviewing local merchants and repairpeople to learn whether they are satisfied with the committee's work, or if they have not had contact with the committee, how they feel about the concept of an ombudsman to handle grievances against local merchants and repairpeople over bicycle purchases and repairs and whether and how they might like to be involved in the committee's work.

Variations and Supplementary Activities:

Students can ask a member of the district attorney's office to act as an advisor to the committee.

Students can also consider setting up their ombudsman committee in conjunction with the local Better Business Bureau.

MINI-UNIT 17

INVESTIGATING BICYCLING IN YOUR COMMUNITY

This final mini-unit engages students in discussions and activities related to two major topics: the purposes for which people can and do bicycle and the identification, use, and development of bicycle facilities. Obviously these two issues are related: how one bikes may be contingent on the availability of certain bicycle facilities.

Bicycles are used by different adults for a variety of purposes, including exercise, commuting to and from work and school, shopping, socializing, and enjoyment. Students need to be familiar with the possible ways in which to use bicycles so that they may take full advantage of the varied opportunities bicycling presents.

However, the extent, convenience, pleasure, and safety with which people bicycle depend heavily on the nature of the bicycle facilities available to them. Bikeways and bike paths, for example, make riding less dangerous and more enjoyable, while equipment for safely securing parked bicycles reduces the potential for theft.

The Federal, state, and local governments have increasingly recognized the importance of bicycle facilities and have collectively been spending several million dollars a year to provide them.

This mini-unit will help students become familiar with what kinds of bicycle facilities there are and how they can best be used. In addition, the unit involves students in identifying what additional or expanded bicycle facilities would be desirable in their communities so that they can engage in appropriate citizen-participation activities to secure them. For example, in the first two activities of this unit students engage in recreational bicycle activities and explore the uses of bicycles for commuting. As a result of these experiences they can identify what additional bicycle facilities the local community needs to make bicycling for recreation and commuting convenient, enjoyable, and safe. The evaluation method of the third activity involves students in selecting a bicycle facility the community needs and actually seeking to have the facility made available.

Furthermore, students need to be concerned about the availability of bicycle facilities not only to improve their own biking opportunities but also to ensure that their children are able to bike in maximum safety.

Key concepts this unit addresses in addition to those outlined above include the following:

- Many different types of activities are available for bicycle recreation.
- Bicycle recreation activities involve a certain amount of planning, including obtaining equipment, choosing sites for the activity, and wearing proper clothing.
- Conditions, such as traffic and weather, affect the desirability of different transportation modes for commuting.
- In order to obtain adequate and satisfactory bicycle facilities for a community, it is necessary to assess that particular community's needs and resources first.
- The public can engage in citizen participation designed to promote the development of bicycle facilities such as bikeways, bike lanes, and safe parking places.

MINI-UNIT 17 LESSON PLAN

Investigating bicycling in your community

Activity #	*Activities*	*Class Time*
60	DESCRIPTION: Students plan, engage in, and evaluate different recreational bicycle activities. GOAL: To be aware of the various types of recreational bicycling activities available, how to plan for these activities, and the benefits of engaging in them.	2-5 periods, plus out-of-class time
61	DESCRIPTION: Students demonstrate in a series of experiments the potential use of bicycles for commuting. GOAL: To be aware of the potential advantages and disadvantages of commuting to school or work by bicycle, as opposed to other forms of transportation.	2-3 periods, plus out-of-class time
62	DESCRIPTION: Students evaluate needed bicycle facilities in the local community, such as bikeways and parking areas, and how to plan and advocate them. GOAL: To know what kinds of facilities are needed in the community (as well as in others) and how to go about obtaining them.	1-2 periods

Total Class Time: 5-10 periods

ACTIVITY #60

Mini-unit Topic: Investigating Bicycle Uses and Facilities

Approximate Class Time: 2-5 periods, plus out-of-class time

Capsule Activity Description: Students plan, engage in, and evaluate different recreational bicycle activities.

Goal:

To be aware of the various types of recreational bicycling activities available, how to plan for these activities, and the benefits of engaging in them.

Concepts Treated:

- Many different types of activities are available for bicycle recreation.
- Bicycle recreation activities involve a certain amount of planning, including obtaining equipment, choosing sites for the activity, and wearing proper clothing.
- Using bicycles for recreation may require the availability of certain bicycle facilities, such as bike paths and safe parking places.

ACTIVITY

Have the students identify recreational bicycle activities they would like to engage in and then break the class into small groups formed around these choices.* Groups plan their activity (obtain needed equipment, select routes and sites, identify referees, etc.) and each submits its plan to one other group for preliminary evaluation. Each then identifies what the objectives are of its activity--why it is doing it and what it hopes to get out of it (e.g., fun, exercise, seeing new places, meeting new people).

After engaging in the activity, each group evaluates it in terms of whether it enabled the group to achieve its objectives, and if not, why not; whether it provided other rewards beyond the expected ones; what kind of physical condition cyclists need to be in to engage in the activity; what facilities and equipment are needed and where they can be obtained to engage in the activity; what safety hazards the activity involves and how the hazards can be minimized or eliminated; and whether children may need different bicycle facilities from adults in order to bicycle safely.

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*Sample activities are provided at the end of the activity.

Groups prepare a report on their experiences and present it to the rest of the class and respond to comments and questions.

Evaluation Method:

Students write a brief brochure for other bike riders who might want to engage in these activities on how to plan for and execute them. Students place copies of the brochures in local libraries.

Variation and Supplementary Activity:

Groups can engage in each other's activities, see if the results in terms of the above points are different, and analyze any differences that are discovered.

Sample Bicycling Activities

Touring

Touring is bicycling for pleasure in the countryside or suburbs for fifteen or more miles, one to several days. Two types of touring are conventional touring, in which the cyclists travel light and use restaurants and motels for accommodations, and camping touring, in which cyclists pack sleeping gear and cooking utensils and rough it. Discussion for both types of touring can center upon the relative advantages and disadvantages of each; equipment needed, such as spare tire, first aid kit, tools, and lightweight camping equipment; transporting bicycles to desired touring locations, using trains, ferries, buses, planes, and cars (there are two types of car racks, rear end racks and roof racks; their advantages and disadvantages can be discussed); concern for wind problems; loop trips where the cyclists return to their point of departure without retracing their route; organizations that can assist tourists, such as

American Automobile Association (AAA)
Local Office or
1712 G Street, N.W.
Washington, D.C. 20006

and publications that can assist tour planning, such as

U.S. Geological Survey Topography Maps
Distribution Section
1200 South Eads Street
Arlington, Virginia 22202

North American Bicycle Atlas
c/o Books About Cycling
P.O. Box 208
Nevada, California 95959

Racing

There are two major categories of bicycle racing: informal and organized. Organized racing is often conducted at colleges with teams. Information on other forms of organized racing can be obtained from the Amateur Bicycle League of America, 4233-205th Street, Bayside, Long Island, New York 11361. Informal racing can involve speed races, endurance races, cross-country racing, slalom racing, coasting, "snail" racing (going as slowly as possible), sprinting, and pursuit racing (trying to catch up with another bicyclist).

Equipment

There are all kinds of ornaments and decorations that can be painted on or otherwise added to bicycles, such as flags, mirrors, roll bars, radios, tassles, odomoter, crepe paper, playing-card noise makers in spokes of the wheels, flowers (real and plastic), and wild paintings and colors. Although organizations are hardly necessary to add these ornaments, clubs can make their creation more fun.

Games

There are many bicycle games that can be discussed, some of which are moderately dangerous if necessary precautions like padded clothing and helmets are not taken. Other games require using an old bicycle since they may involve damage to participating bicycles. Examples of bicycle games are provided below. Other games include scavenger hunts, obstacle drops, and relays. These games can be discussed in terms of needed equipment, safety considerations, convenience, and forming clubs to engage in them. For rules of Bicycle Polo, write to

U.S. Bicycle Polo Association
Carlos F. Concheso
P.O. Box 565
FDR Station
New York, N.Y. 10022

Bike Games and Races*

Slow or Snail Ride

The object of this funny game is to see which rider can travel slowest. The last rider to cross the finish line wins. Any type of bicycle can be used.

Lay out a course 50 to 100 feet long with several lanes three to six feet wide. Assign a lane to each rider. Run several heats if necessary. At a signal, each rider gets underway at the starting point, riding as slowly as possible. Disqualify any rider who does not stay in his lane, who touches a foot to the ground, or who turns around. Appoint a referee to be sure rules are obeyed.

The last rider to cross the finish line is the winner. If several heats are run, have winners race in a run-off.

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*From *Guide for Leaders: 4-H Bicycle Program* (U.S. Department of Agriculture, Extension Service: Washington, D.C. 20520). Games should be chosen according to the ability and experience of the bicyclists and the space and equipment available.

Grab Bag

A variation of musical chairs, this game is played by having playground equipment or other objects suspended from ropes. Riders grab the objects while their bikes are in motion. Those who fail to grab objects when the "stop" signal is given must drop out. The rider remaining in the game longest wins.

Large balls or other objects lying on the ground can also be used in a pick-up version of the game. Confine the riders within definite boundaries.

Pick and Put

This game is designed to develop sprint technique and the ability to mount and dismount a bicycle quickly. It requires two goals at least 50 feet apart.

Choose two teams with an even number of riders on each. Select ten or fewer small objects--potatoes, empty cans, stones, rubber balls--which a rider can carry in one hand. Draw two two-foot circles side-by-side at each end of the course. Place half of the small objects in one circle at one end, the others in one circle at the other end.

The object of the game is to transfer all objects in one circle to the empty circle at the opposite end before the opposing rider can do the same thing. Only one object is carried at a time.

Teams line up at opposite ends. At a signal, one member of each team mounts his bike and rides to the other end, dismounts, and picks up an object from the circle. He then remounts and rides back to the starting point, dismounts, and places the object in the empty circle. He continues this routine until all objects from the other end have been transferred to his team's end.

The rider who finishes first earns ten points for his side. In case of a tie, points are split. If a rider drops the objects enroute, he is disqualified and the other team scores. If riders collide or if one becomes dismounted but retains his object, riders may remount and continue the game.

The game continues until all riders have completed the course. Highest scoring team wins.

Paul Revere

This is a speed test, Select two teams with the same number of riders on each side. Have them line up astride their bikes in two lines 30 feet apart. Space members five feet apart in line. Players count off from right to left. When the leader calls off a number, the two players with that number mount their bikes and ride clockwise around both lines and back to their starting points. The rider arriving last drops out of the game. After all numbers have been called, the team with the most riders left wins.

Hitting the Target

This game requires skill and good coordination. Set out four to six coffee cans, bowls, or other receptables in a row about 15 feet apart along a 100-foot course. If the ground is soft, press the containers into the ground with open end up.

Give each rider a supply of marbles, bottlecaps, small stones, or similar objects. Contestants then ride along the course dropping a marker in each can. Award one point for each hit.

A variation of this game is to number each rider and each can. Each rider is required to drop his marker in the can with his number on it. Riders who miss their cans are eliminated. Repeat the course until only one rider is left as the winner.

Spud

This game is played in a large open area with a softball or volleyball. One player becomes "it" and stands with his bike and the ball in the center of a circle. The other players ride their bikes around the circle until "it" calls one of their names and tosses the ball into the air. The player whose name is called rides for the ball, dismounts and picks it up. Meanwhile, the other riders scatter, including "it". When the person called has retrieved the ball, he yells, "Halt," and every rider must stop immediately, straddling his bike. The player with the ball returns to the center of the circle and attempts to hit one of the other bikes by rolling the ball at it. Riders cannot move themselves or their bikes, and thrower cannot move away from center of the circle. If thrower misses bike, one dud is counted against him and he becomes "it." If he hits the bike with the ball, that player gets one dud and becomes "it."

When a player gets three duds, he is disqualified or penalized in some manner.

Pursuit Race

This is an elimination race determined by speed. Line up all contestants about three feet apart at the starting line. Start the race with a whistle or other signal. Object of the race is to pass the leader. As the leader is passed by another rider, he must drop out. This continues until only one rider is left and he crosses the finish line.

Mixed Distance Race

This is a relay race with each team member riding a different number of laps. It is most interesting when the distances are mixed with fewer laps coming at either end or as sprint laps. As a contestant completes his required number of laps, he passes a baton or touches the hand of his successor. The team that finishes first is the winner.

Reds and Whites

Select two teams, "Reds" and "Whites." Lay out a 200-foot field with a center line, two lines ten feet back from the center on each side, and end lines 100 feet from the center. Players line up five feet apart on their own line ten feet back from the center line. Teams face each other.

A starter stands at the end of the center line and tosses a red and white disc. He calls the side that comes up. The players on the side not called mount their bikes, turn around and ride as fast as possible to their own back "safety" line. The team whose color is called mounts and chases them, tagging as many of the other team as possible before they cross the safety line. Those tagged become members of the other team. The winning team is the one with the most players after a limited number of tosses of the disc.

Ride, Sheep, Ride

Divide riders into two teams, "Sheep" and "Hunters," and select a home base. While the hunters close their eyes or remain indoors, the sheep and their leader ride out to hide. They agree on a set of signals to be called by their leader. These might include short or long horn blasts, a whistle, or special words such as "indians" or "cowboys" meaning "lie low," "move up toward base," "get ready to ride for home," or other commands.

When all sheep have been hidden, the leader returns to home base and rides out with the hunters. He calls signals as appropriate to keep his team from being discovered. When he thinks the hunters are off guard or far enough away, he yells, "Ride, sheep, ride." At this signal the sheep emerge from their hiding places and ride fast for home base. Hunters also race for home. The full team that arrives home first wins. This team is the "sheep" for the next game.

If cover is not plentiful, it may be necessary to divide your group into several teams of "sheep" and "hunters" with different home bases.

Tug-o-War

This is a game of team strength and endurance. Stretch a long rope on a level surface, tie a handkerchief in the middle, and put out markers or stakes four yards apart. Line up the two teams on opposite sides of the markers with the rope stretched between them so that the handkerchief is midway between the two markers. Riders face away from the middle. Each player grasps the rope with one hand. At the command, "Ready," he mounts his bike and establishes balance by a slight, even pull on the rope. On the command, "Go," all riders pedal hard and pull on a rope. Object is to pull the handkerchief past the marker on your side. If a rider's body or foot touches the ground, he is disqualified and the game continues without him.

Run and Ride Race

Contestants in this race start by either riding or running beside their bikes for a given distance. They then change to the opposite side, alternating as often as desirable until they complete the course.

Simple Relay Race

Line up teams in single file behind starting line. At the signal, first player on each team rides out to goal 100 feet away, turns around, and rides back, touching off second rider. He then takes his place at rear. Players move up to starting line as their turn approaches. Winner is team whose last man returns to starting line first.

Plank-riding Race

Lay out a series of wooden planks, five to six inches wide, for a distance of at least 150 feet. Contestants try to ride the entire distance without running off the planks. The rider who completes the course in the fastest time with the fewest slips off the plank is the winner.

Potato Relay

Obtain four to six potatoes for each team. Place potatoes in a box or basket at the starting point for each team. Mark off a series of circles five yards apart in front of the box.

Start the game with all potatoes (blocks, stones, etc.) in the box. First rider takes one potato, places it in first circle, and returns to the starting point. Second rider takes second potato and places it in second circle. Repeat until all potatoes have been placed in circles. Then reverse procedure, retrieving one potato at a time. Team that finishes first wins.

Game can be varied by having one player on each team place all potatoes before second player takes his turn. Game can also be reversed with all potatoes placed in circles at beginning and retrieved and replaced one by one.

If only a few players are available, game can be played as race against time with fastest player declared winner.

Dizzy Relay

Place round poles or other objects players can ride around from 50 to 100 feet in front of starting point. Line up teams in single file.

At signal, first rider on each team rides to goal and circles it at least three times. If pole is used, he keeps one hand on it as he rides around. He then returns to base and tags next rider on his team who repeats procedure. Team finishing first wins game.

Files should be at least ten feet apart and all riders should circle poles in same direction to avoid collision.

Shipwrecked

Select a large playground or parking lot. Line up all players on one side, side-by-side facing the center of the lot. Place a large piece of paper, sandbag, or other target made of something soft and harmless in the open area. Each player in turn rides forward, is blindfolded, and rides out to mark the target. Other players on bikes surround him at a safe distance and clap their hands when he gets warm, reducing their clapping as he goes away from the target. When he thinks he has reached the target, the blindfolded rider gets off his bike and marks the spot with a stick or other marker. The rider who comes closest to the target wins the game.

ACTIVITY #61

Mini-unit Topic: Investigating Bicycle Uses and Facilities **Approximate Class Time:** 2-3 periods, plus out-of-class time

Capsule Activity Description: Students demonstrate in a series of experiments the potential use of bicycles for commuting.

Goal:

To be aware of the potential advantages and disadvantages of commuting to school or work by bicycle, as opposed to other forms of transportation.

Concepts Treated:

- Many forms of transportation, both public and private, are available for commuting from home to school or work.
- Each form of transportation, including the bicycle, has certain advantages and disadvantages for commuting.
- Other conditions, such as traffic and weather, also affect the desirability of different transportation modes for commuting.
- Using bicycles for commuting may require the availability of certain bicycle facilities, such as bike paths and safe parking places.

ACTIVITY

Students in small groups compare different forms of transportation used for commuting from home to school or work by traveling the same routes with different vehicles. The purpose of the activity is to weigh the advantages and disadvantages of commuting by bicycle.

The groups use a map of the community and plot out a commuter route used by many community persons. An arbitrary "home" is selected for the starting point, and a factory, school, or large place of employment is selected as the destination.

Students decide which modes of travel they will use other than bicycling, such as car, bus, or rapid transit. The groups then determine what should be observed during the trip, such as how long the trip takes and what delays or speeds it up; how weather conditions affect the trip's speed, comfort, and safety; what safety practices or regulations are or are not observed; how traffic conditions affect the trip's time, safety, and comfort; what the commuter's mental attitudes are before and after the trip--relaxed? jittery?; other characteristics of the trip affecting speed, safety, and comfort, such as baggage, and weather; and bicycle facilities needed to make commuting pleasant, convenient, and safe (e.g. bike lanes, parking facilities).

The groups should be aware that the experiment will not be a reliable indicator of the advantages and disadvantages of commuting by bicycle if the participants take special pains to make their trip as fast as possible (or faster than normal).

The groups decide when to make the trip--morning or afternoon rush hours--and set specific starting times. They also decide who is going to use which modes of transportation.

After completing the trips, the groups compare individual results and draw appropriate conclusions about which mode is best, and why. In particular, the groups discuss the advantages and disadvantages of bicycle commuting and the bicycle facilities needed to do so easily and safely.

The groups prepare and present a report to the class and respond to comments and questions.

Evaluation Method:

Students develop a public service announcement extolling the advantages of commuting by bicycle and seek to have it presented on a local radio station, television station, or in a local newspaper.

Variations and Supplementary Activities:

Students can determine reasonable commuting distances for bicycle travel in their area.

Students can compare modes during non-peak hours.

Students who cannot take trips can take traffic counts at several strategic spots along a commuter route. Students analyze the results in terms of how traffic might affect different modes of commuting.

Students can compare the costs of parking bicycles and cars.

Students can discuss whether and how the bicycle can be promoted as a method of commuting.

Students can discuss the energy-saving aspects of using bicycles for commuting to work or school and evaluate whether and how this feature can be used as an incentive to promote increased use of bicycles.

ACTIVITY #62

Mini-unit Topic: Investigating Bicycle Uses and Facilities **Approximate Class Time:** 1-2 periods

Capsule Activity Description: Students evaluate needed bicycle facilities in the local community, such as bikeways and parking areas, and how to plan and advocate them.

Goal:

To know what kinds of facilities are needed in the community (as well as in others) and how to go about obtaining them.

Concepts Treated:

- In order to obtain adequate and satisfactory bicycle facilities for a community, it is necessary to assess that particular community's needs and resources first.
- Planning for community bicycle facilities involves going through a number of well ordered steps.
- The public can engage in citizen participation designed to promote the development of bicycle facilities such as bikeways, bike lanes, and safe parking places.

ACTIVITY

Begin this activity by discussing what bicycle facilities presently exist in the community and then evaluate what other facilities may be needed and how citizens can plan for and advocate these facilities. The discussion can cover five areas, as follows:

1. *Definition of terms* that describe facilities include bikeways--streets with signs indicating that they may be used by bicyclists, but that there is no separation between cyclists and motorists; bike lanes--right-hand sections of streets marked off by a white line for use by bicyclists; and bike paths--trails for bicycles that are physically separate from streets.

2. *Types of facilities* that can be identified include bikeways, bike lanes, bike paths; street signs warning automobile drivers that bicyclists are on the streets; convenient and safe parking

facilities for bicycles (metal, well lighted, easily observable); legislation--not exactly a "facility" but within the general area of this discussion (for example, legislation allowing bicyclists to use uncrowded sidewalks); and street cleaning to remove glass and other debris from the edges of roads where bicyclists travel.

3. *Purpose of facilities* vary according to the facility. Some examples that can be discussed include purposes of bike paths and lanes--safety, speed, convenience, distance from car exhaust fumes and purposes of parking facilities--convenience (closeness to destination), safety (where pedestrians and cars won't run into them), security (reduced risk of theft).

4. *Determining what facilities are needed* involves two steps: deciding what types of facilities are needed--parking facilities, signs, bike paths, bike lanes, etc. (this can be done by conducting polls and interviews, by observing community traffic patterns, and contacting appropriate officials in government and private agencies and organizations) and deciding what the particular characteristics of each type of facility should be, including for parking facilities: where they should be located, what they should be made of, whether they should be metered or free, etc. and for bike lanes and paths: how wide they should be, how steep, how they should be surfaced (concrete, dirt, etc.), with overpasses and underpasses, etc.

5. *Indicating how facilities may be obtained* also involves two steps, one research oriented, and one action oriented: Identify who in the community makes or could make the important decisions about bicycle facilities and who has the power and money to implement these decisions (e.g., Departments of Public Works, Departments of Transportation, politicians, Park and Recreation Departments, highway or traffic engineers, etc.). The 1973 Federal Highway Act permits states to spend up to $2 million a year of highway funds on bike paths and parking facilities.* Then discuss the actions citizens may take to influence these individuals and agencies to provide bicycle facilities, such as writing letters to key individuals; organizing meetings with key individuals, agencies, and organizations to explain the need for bicycle facilities and press for their development; circulating petitions in the community and forwarding them to key individuals or agencies and organizations by mail or at a meeting; during political campaigns, asking candidates to take a stand on providing bicycle facilities; joining bicycle organizations that engage in political activity, such as

   Concerned Bike Riders for the Environment
   P.O. Box 24388
   Los Angeles, California 90024

   Friends for Bikecology
   1035 East De La Buerra
   Santa Barbara, California 93103

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*See the reading at the end of this activity.

organizing bike-ins, rallies, and conventions (bike-ins involve attention to route selection, notification of proper authorities, involvement of the media, and determination of objectives); demonstrating the need for facilities (e.g., if parking on the sidewalk is not allowed, parking in automobile spaces to demonstrate the need for bicycle parking facilities); and building facilities or otherwise providing them oneself (e.g., developing bike paths or building parking facilities; permission, if not active assistance, from local authorities is usually needed for these activities.)

Specific information for securing funds for new bikeways in the local community is contained in a government publication entitled *Bicycles and Pedestrian Facilities in the Federal-aid Highway Program.* Major portions of this pamphlet are provided at the end of this activity. In addition to reading the information provided in this publication, students will also need to learn which local government agencies have jurisdiction for planning and funding bikeways and what procedures these agencies have set up for receiving comments and petitions from local residents.

Follow-up discussion can involve identification of what facilities are actually needed in the students' own community and why; how such facilities could be obtained; consideration of whether to develop and implement a plan to obtain them in the students' own community; discussion of the legitimacy or ethics of different types of pressure group activity, from bike-ins to demonstrations; and discussion of the relative effectiveness of various forms of pressure to obtain bike facilities.

Evaluation Method:

Each student selects one facility he or she would like developed in the community, records why, and writes out a strategy for obtaining it. Students exchange papers and the class reaches a consensus on the best two or three plans. In small groups the class then seeks to have the local community develop the facilities advocated in these plans.

Variations and Supplementary Activities:

Students can poll the community on its attitudes toward bicycle facilities.

Students can be given the following scenario and then engage in the exercise which follows:

> You have just been put in charge of deciding what public bicycle facilities your community should have. In addition, you have been given a million dollars to spend on building them. What, *exactly*, will you build and where?

Students then break into small groups, read each other's papers, and discuss them. Group discussion should center on what facilities those in the group agreed that the community needs; what facilities the group disagreed on and why; and what are the most important facilities to get first and why. The groups report their conclusions to the class and respond to comments and questions.

Bicycles and Pedestrian Facilities in the Federal-aid Highway Program*

Bicycle and Pedestrian Facilities in the Federal-aid Highway Program

In carrying out its responsibilities in the administration of the Federal-aid highway program, the Federal Highway Administration (FHWA) has responded to the changing transportation needs and desires of the American public. One of these changes is the increasing need and desire for bicycle facilities.

To meet this change, the FHWA has approved the provision of bicycle and pedestrian facilities as a part of a Federal-aid highway project wherever conditions are favorable and a public need is served. The policy has thus far resulted in 55 miles of bicycle facilities constructed at an approximate cost of $2 million and another 334 miles planned at an estimated cost of $15 million. At least 23 states have taken advantage of this policy.

In 1973, Congress enacted the Federal-aid Highway Act of 1973 which permitted FHWA to expand its bicycle program. Section 124 of this act (Title 23, U.S. Code, Section 217) allows the use of Federal-aid highway funds to construct bicycle and pedestrian facilities independent of regular highway projects. It should be noted that funds are not reserved exclusively for bicycle or pedestrian facilities but are in fact highway funds that may be used for highways, bikeways, and walkways.

The Federal-aid Highway Program

The Federal-aid highway program is a cooperative effort between the states and the Federal government. Each year, the Federal Highway Administration apportions Federal-aid highway funds to the states for the planning, construction, and improvement of roads and bridges on the Federal-aid highway systems. The states are responsible for the administration of these various types of funds.

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* Published by the U.S. Department of Transportation, Federal Highway Administration (FHWA), 1974.

Highway planning and research funds (HP&R) and planning funds (PL) are used to fund the planning and research activities necessary for development and implementation of highway projects, including bicycle and pedestrian facilities. The limit of the Federal-aid share of planning and research project costs is approximately 80 percent.

HP&R projects may be located anywhere in the state and are selected by the state transportation agency. PL funds are to be used for planning projects that are located in an urbanized area which contains a population of 50,000 or greater. The metropolitan planning organization responsible for transportation planning in the urbanized area selects the projects to be financed with PL funds.

The FHWA apportions construction funds to the states on a system basis: interstate, primary, secondary, and urban. The limit of the Federal-aid share of interstate system project costs is approximately 90 percent and approximately 70 percent for the other systems' project costs.

Projects proposed for Federal-aid funding on the interstate, primary, and secondary systems are selected by the appropriate state transportation agency with consideration of state and local needs and desires.

Urban system funds may be used for projects located in urban areas of 5,000 population or greater. Also, a certain portion of urban system funds must be spent in urbanized areas with a population of 200,000 or greater. Projects proposed for Federal-aid funding on the urban system are selected by local elected officials acting through the metropolitan planning agency. These projects must have the specific concurrence of the state transportation agency and the state transportation agency should be contacted to determine the Federal-aid highway systems in a particular area. This information may also be obtained from the FHWA division office located in each state.

Funding Bicycle and Pedestrian Facilities

Planning and Research Projects

Planning and research activities that are necessary for the development of bicycle facilities may be financed with HP&R and PL funds. Where appropriate, planning for bicycle and pedestrian facilities should be included in the normal ongoing transportation planning process.

Construction Projects

The FHWA encourages the construction of bicycle and pedestrian facilities as part of the regular Federal-aid highway program. The construction of bicycle and pedestrian facilities may be approved where all of the following conditions are satisfied:

1. The facility will not impair the safety of the pedestrian, bicyclist, or motorist.

2. The facility will connect with existing facilities usable by bicyclists or it will form a segment of a proposed bicycle system.

3. A public agency has formally agreed to operate and maintain the facility and ban all motorized vehicles except maintenance vehicles and snowmobiles when snow conditions and state or local regulations permit.

4. It is reasonably expected that the facility will have sufficient use in relation to cost to justify its construction and maintenance.

Incidental Construction Projects. Bicycle and pedestrian facilities may be constructed as incidental features of highway construction projects when the bikeway or walkway is to be constructed concurrently with the improvement for motor vehicular traffic and the bikeway or walkway will be within the normal right-of-way of the highway, including land acquired for traffic improvements and scenic enhancement programs. Projects constructed as incidental features of larger highway construction projects may be financed with the same type of Federal-aid funds used for the basic highway project, including Interstate projects, and are not subject to the funding limitations for independent bikeway or walkway projects.

Independent Construction Projects. Bicycle and pedestrian facilities may also be built independently of other highway construction projects. Such projects may be constructed on existing highway right-of-way or on special right-of-way or easements acquired for this purpose. Where facilities are to be located away from Federal-aid highway right-of-way, they must serve bicycle and pedestrian traffic which would normally desire to use the Federal-aid highway route.

The limit of the Federal-aid share of independent bicycle and pedestrian project cost is approximately 70 percent. A state may spend up to $2 million of Federal-aid funds in a year for independent bicycle and pedestrian facilities, provided a nationwide total of $40 million annually is not exceeded.

Features of Bicycle and Pedestrian Facilities

Bicycle and pedestrian facilities may include various features which will make their use safe, enjoyable, convenient, and efficient. The following are some of the features which may be included in a bicycle and pedestrian facility financed with Federal-aid highway funds.

1. Grading, drainage, paving, barriers, landscaping, and structures necessary to accommodate the number and type of users of the facility

2. Fixed source lighting where its use is appropriate

3. Right-of-way (land acquisition and relocation assistance) on independent bikeway and walkway construction projects

4. Curb-cut ramps on new existing facilities, including ramps which are required for access by the physically handicapped

5. Bikeway and walkway grade separations where vehicular speeds and crossing volumes constitute a hazard of such magnitude as to justify the cost of the structure and the bikeway or walkway cannot be rerouted to another structure or the separation is necessary because the highway has complete control of access

6. Traffic control devices including signs, signals, and pavement markings

7. Supplementary features such as shelters, parking, storage facilities, and comfort stations

8. Walks, barriers, and additional widths and lengths on bridges necessary for bikeways and pedestrian walkways for route continuity

Acquiring Federal Aid

The first recommended step in acquiring Federal-aid for bicycle and pedestrian facilities is gaining the support of local governments for the proposed facility. Local governments provide valuable input into the highway program. This input varies from suggestions on the location and design of the facility to the selection of specific projects to be financed with Federal-aid highway funds.

The second step is to contact the local and state organizations previously identified as having the responsibility for the selection of projects to be financed with Federal-aid highway funds.

Further information concerning the operation of the Federal-aid highway program in a particular state may be obtained from the FHWA division office for that state.* The division offices can also provide specific information on state and local government agencies which should be contacted in conjunction with the development of projects.

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*Check your phone book under your state government for the office in your state.

BIBLIOGRAPHY

BIBLIOGRAPHY

This Bibliography section contains teaching materials for teachers and students. It consists of selected

- Student materials, many of which can be read by teachers for background information
- Audiovisual materials
- Periodicals

The individual entries are presented in the following format:

	** *Title of Work,* author, date of publication. Number of pages, or list of materials. Price.
Type of Material	Description of material with evaluation of material's quality (except for audiovisual materials and supplementary materials) and relevance for bicycle education.
	Source from which material may be obtained.*

For purposes of convenience, the teacher and student materials sections have been rated by the designation of stars next to the titles (see sample above). The stars represent the following evaluation:

No stars:	Material is useful, but fair
(*) One star:	Material is good
(**) Two stars:	Material is very good
(***) Three stars:	Material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality* and *relevance.*** As such, the absence of a teaching material or a low rating does not *per se* indicate the material is poor. It may be excellent but simply not relevant. In addition, many books on bicycles have not been included. There are simply too many on the market to evaluate all of them. Any absences may also be due to the authors' oversight.

Finally, the reader should be aware that *Bicycling!* magazine has published a complete, annotated and invaluable bibliography of all bicycle literature, organizations and legislation in its July and September 1972 issues. In addition, an annual supplement to that original list is promised each year. Audiovisual materials are not included.

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* Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

** A complete discussion of the criteria used to evaluate the materials may be found at the end of this Manual.

At the end of the Bibliography is a list of government agencies that can be contacted for further information about bicycles.

Student Materials

* *Bicycle Blue Book,* (not dated). 14 pages. Free.

Flyer

Brief instructions on how to care for a bicycle, including a checklist of items to periodically examine, clean, or replace. The section on tire care and selection recommends the use of the distributor's tires.

The Goodyear Tire & Rubber Company
Public Relations Department
Akron, Ohio 44316

** *Bikes,* by Stephen C. Henkel, 1972. 189 pages. $1.25.

Paperback

Comprehensive, straightforward account of bike styles, purchasing a bike, learning to ride, maintenance and repair, safety, and "having fun." Profusely and very well illustrated. Sections on do-it-yourself maintenance and repairs are especially good.

Bantam Books, Inc.
666 Fifth Avenue
New York, N.Y. 10019

** *The Bicycle Book,* edited by Bob Boethling, 1971. 63 pages. $1.50.

Booklet

Gamey and well formatted advice on a variety of bicycle topics, including buying a bicycle, bikeways, theft, recreational cycling organizations, legal problems, and maintenance. Not well illustrated.

Price/Stern/Sloan Publishers, Inc.
410 North Cienega Blvd.
Los Angeles, California 90048

*** *The Bike Book,* by Bibs McIntyre, 1974. 262 pages. $1.25.

Paperback

Excellent discussion of how to buy, maintain, and safely ride a bicycle. Unusual chapters deal informatively with how to prevent theft, how to work up to a 50-mile trip, and which accessories "would you really use." Exceptionally good resources section including list of local, state, and national bicycle clubs, racing organizations and clubs, and American Youth Hostel local council offices.

Pyramid Communications, Inc.
919 Third Avenue
New York, N.Y. 10022

** *Anybody's Bike Book,* by Tom Cuthbertson, 1971; revised, 1973. 176 pages. $3.00 plus 25¢ postage.

Paperback Illustrated, easy to read, well organized manual of bike repairs for the amateur and serious enthusiast.

Ten Speed Press
Box 4310
Berkeley, California 94704

** *The Clear Creek Bike Book,* 1972. 179 pages. $2.95.

Paperback Informative, but somewhat meandering description of bicycle history; how to buy, ride and repair a bicycle; safety issues; and racing and touring. Unusual are the two sections on the history of bicycles and health benefits from bicycling. The section on politics is an especially useful discussion of how to influence the development of bikeways and parking facilities for bikes. Excellent photographs.

The New American Library, Inc.
1301 Avenue of the Americas
New York, N.Y. 10002

** *Richard's Bicycle Book,* by Richard Ballantine, 1972. 249 pages. $1.95.

Paperback Profusely and well illustrated account of how to maintain and repair a touring bicycle. Discussions of how to buy and ride a bike are included.

Ballantine Books, Inc.
201 East 50th Street
New York, N.Y. 10022

** *Consumer Guide: Bicycles: Complete Buying Guide,* 1972. 384 pages. $1.50.

Paperback Detailed evaluation of bicycles arranged by age and price based on actual road testing. Book also includes discussion of bicycle safety considerations and how to buy a bike. Interesting sections are provided on the health benefits of bike riding and detailed rules for bicycle polo. List of bicycle clubs by state is included.

Popular Library
355 Lexington Avenue
New York, N.Y. 10017

Parents, Buying Your Child a Bicycle, (not dated). 6 pages.

Flyer Very brief instructions to parents on whether to buy their children a bicycle, and if so, what kind of bike to buy.

American Automobile Association
1712 G Street, N.W.
Washington, D.C. 20006

* *Bicycles: Safety Education Data Sheet Number 1.* (not dated). 7 pages.

Pamphlet Brief discussion of safety aspects of bicycles. Provides useful information but not very imaginatively. Part of a series of data sheets on safety.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611
Stock No. 429-04-1

Fact Sheet, (not dated). 4-6 pages. Single copies free.

Flyer Series of flyers on various aspects of bicycles, such as bicycle usage, locations of accidents, and boy vs. girl bicycle accidents.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

* *Helpful Hints on Bicycle Care for Safer Riding,* (not dated). 4 pages.

Flyer Quick but detailed overview of how to maintain a bicycle. Many of the suggested tasks involve more work than most riders will be willing to engage in.

Bicycle Manufacturers Association
1101 15th Street, N.W.
Washington, D.C. 20005

* *Bike Quiz Guide; Pedal Primer; Bicycles,* (not dated). 7-9 pages each. Free.

Pamphlet Three small introductory brochures on bicycle safety and maintenance.

Bicycle Manufacturers Association
1101 15th Street, N.W.
Washington, D.C. 20005

Model Bicycle Ordinance, (not dated). 10 pages.

Flyer Standard bicycling regulations excerpted verbatim from the Uniform Vehicle Code and the Model Traffic Ordinance.

American Automobile Association
1712 G Street, N.W.
Washington, D.C. 20006
Stock No. 3206

* *Skill Tests for Pedal Pushers,* (not dated). 6 pages. Free.

Flyer Ten detailed bicycle skill tests with scoring system for each and summary score sheet. Tests are for determining safety skill levels but may also be conducted as contests for fun.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Bicycle Safety Tests and Proficiency Course, (not dated). 23 pages. Free.

Pamphlet Series of detailed proficiency and safety tests riders can practice. A model inspection form for bike maintenance is also provided.

Bicycle Manufacturers Association
1101 15th Street, N.W.
Washington, D.C. 20005

* *Bicycle Safety Program Aids,* (not dated). Ten pamphlets and three posters.

Packet Folder of materials on bicycle safety and use. Included also are a pamphlet to parents on buying their children a bicycle, the results of an AAA survey on the nature and causes of bicycle accidents, a bicycle skill tests pamphlet (well illustrated and described), and a bicycle inspection checklist.

The American Automobile Association
1712 G Street N.W.
Washington, D.C. 20006
Stock Number 3289

** *North American Bicycle Atlas*, 1972. 127 pages. $2.60.

Guide

Extremely useful descriptions of about 80 long rides and 61 short rides cyclists can take throughout the country. Descriptions include scenery, facilities, difficulty, and type of equipment needed. Trips are rated according to difficulty: easy, fairly easy, intermediate, hard, and rugged. Introduction discusses lodging, equipment, safety, and handling dogs.

American Youth Hostels, Inc.
Delaplane, Virginia 22025

* *Bike-ways (101 Things to do with a Bike)*, by Lillian and Godfrey Frankel, 1972.

Book

Informative accounts of how to have fun with a bike, including games, skill exercises, trips, tours, and camping. Included are brief discussions of safety, how to select a bike, parts and accessories, and maintenance. The section of 25 games is especially useful.

Sterling Publishing Company, Inc.
419 Park Ave. So.
New York, N.Y. 10016

Bicycling and Bicycle Trails, A Trails and Trail Based Activities Bibliography, 1971. 31 pages. $3.00

Bibliography

Bibliography of books and articles on various aspects of bicycling. Index is conveniently arranged by topic, with largest number of entries being history, safety, and trails. Somewhat outdated due to the great number of bicycle publications since 1971.

National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22151

** *Bike Tripping*, by Tom Cuthbertson, 1972. 172 pages. $3.00

Paperback

Lively, informative account of how to take bike trips in terms of safety, the weather, where to go, and equipment to carry. Book also discusses learning to ride and purchasing a bike. Illustrated.

Ten Speed Press
Box 4310
Berkeley, California 94704

Bicycling for Recreation and Commuting, 1972. 26 pages.

Pamphlet Simple overview of bicycling safety, trails, and history.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

* *Bikeway Planning Criteria and Guidelines*, 1972. 171 pages.

Report Report on the needs for bikeways for the state of California. This interesting study incorporates more information about bicycles than just statistics about width of bikeways, although such figures are its major focus. Begins with useful historical perspective.

Institute of Transportation and Traffic Engineering
School of Engineering and Applied Science
University of California
Los Angeles, California

Audiovisual Materials

National Directory of Safety Films, 1971. 60 pages. $3.50.

Catalogue Capsule descriptions of safety films that can be rented from the National Safety Council; however, none are evaluated and many are included that are either poor or mediocre. The reader must take pot luck and preview all films ordered before using with students. Most of the films listed below are taken from this catalogue.

National Safety Council
425 N. Michigan Avenue
Chicago, Illinois 60611

Bicycle Rules of the Road. 11 minutes, color, 16 mm.

Film A dramatic demonstration emphasizes driver reaction time and the stopping distances of both automobiles and bicycles. Staged collision tests, using slow motion photography, forcibly demonstrate what happens when an automobile impacts with a bicycle at 25 and 47 mph.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Bicycle Safety. Color, 35 mm.

Film Illustrates where to learn to ride; what rules to follow when riding during the day, at night, and in the rain; how to prevent tire damage; and how to carry packages on a bike.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Bicycling with Complete Safety. 10 minutes, 16 mm.

Film Film on bicycling safety for adults and children.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Championship Bicycle Safety. 13 minutes, color, 16 mm.

Film Fast-paced film which relates the cycling skills of the champs to the skills needed in everyday cycling situations, with emphasis on the idea that it takes practice to ride like a pro. Includes clowns riding antique bikes in a local rodeo who demonstrate the need for watchfulness to avoid hazards.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

If Bicycles Could Talk. 13 minutes, color, 16 mm.

Film Covers all aspects of bicycle safety and maintenance, as well as the role of parents in preparing youngsters for bicycle ownership.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Two Wheels Toward Safety. 20 minutes, color, 16 mm.

Film Film shows how bicycle accidents are reduced through education in a community effort in Nassau County in New York.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Periodicals

Periodicals are a rich source of information on the use and purchase of bicycles and bicycle facilities and on the availability and location of additional materials on bicycles. Even general consumer periodicals, like *Consumer Reports* and *Changing Times,* contain in many issues articles on bicycles. It was impossible, however, to provide here a list of relevant articles that have appeared in the recent past in periodicals. Moreover, the subscriber or reader cannot know in advance when a periodical will print an article that will interest him. Despite these drawbacks, many teachers and students will find it useful to subscribe to or read library copies of periodicals in the expectation that they will discover articles or references to additional materials of immediate relevance to their teaching or research efforts. The more specifically a periodical is related to his particular interest, of course, the more likely the reader is to find relevant materials. Teachers and readers can also consult in libraries the *Reader's Guide to Periodical Literature* for past articles about bicycles.

American Bicyclist
461 Eighth Avenue
New York, New York 10001

Bicycle Journal
3339 West Freeway
Fort Worth, Texas 76107

Bicycling
119 Paul Drive
Box 3330
San Rafael, California 94902

Bike World
Post Office Box 366
2536 Middlefield Road
Mountain View, California 94040

Boom in Bikeways
Bicycle Manufacturers Association
1101 15th Street, N.W.
Washington, D.C. 20005

League of American Wheelmen Bulletin
19 S. Bothwell Street
Palatine, Illinois 60067

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

Federal Agencies with Responsibility or Interest in Bicycling

You may write to the following government agencies for bicycling information:

Federal Highway Administration
U.S. Department of Transportation
Washington, D.C. 20590

National Highway Traffic Safety Administration
U.S. Department of Transportation
Washington, D.C. 20590

Bureau of Outdoor Recreation
U.S. Department of the Interior
Washington, D.C. 20240

National Park Service
U.S. Department of the Interior
Washington, D.C. 20240

Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

4-H Bicycle Program
U.S. Department of Agriculture
Washington, D.C. 20250

U.S. Consumer Product Safety Commission
5401 Westbard Avenue
Washington, D.C. 20207

Bibliography Evaluation Criteria

All teacher and student materials that were located were evaluated along two dimensions: *quality* and *relevance*. *Quality* was defined to include the following components:

- Provision of creative and detailed classroom activities or learning experiences that go beyond the one- or two-sentence "have the students do *x, y, z*" suggestions
- Development of decision-making skills that may be transferable to other consumer issues
- Attention to affective educational approaches and objectives, not merely cognitive ones
- Emphasis on student initiative and involvement in classroom activities and in the planning of those activities
- A concern-centered approach that predicates learning on the assessment of student concerns and the development and use of classroom activities that initially deal with those concerns
- The provision of a lucid conceptual framework of bicycle consumer education by which teachers can grasp the field and the interrelationships of its components and by which teachers can develop additional activities and units of their own
- A modular, flexible approach that enables teachers to develop activities and units tailored to the needs of their particular students and community
- Provision of accurate factual information
- A nonmoralistic, noninjunctive approach
- Stress on the needs and problems of minority groups
- An interdisciplinary approach to consumer education

Few curriculum materials combined all these quality ingredients. Many included none or a few. In some borderline cases where a teaching material contained some quality ingredients, the authors made a subjective evaluation on whether the material contained *enough* of these elements to warrant referencing in the module.

To be considered *relevant*, a teaching material had to deal in a significant way with bicycle education from the point of view of or use to a consumer. Teaching materials were excluded from the module when their relevance was extremely limited or nonexistent because

- Only a small section of the material dealt with bicycle consumer issues. However, such materials were included when a subsection was of high caliber, dealt with an important aspect of bicycles not covered elsewhere, or was part of an easily accessible and inexpensive unit.
- The material was extremely specific--it dealt with too narrow an aspect of an issue to be useful to teachers or students except in highly specialized courses or units.
- The material was designed for a highly specialized audience.
- The material was oriented strictly toward career education.
- The material was outdated.
- The material contained information that applied primarily or significantly to a local situation.
- The material was not distributed out of state.

SPIRIT MASTER #1: FOR USE WITH ACTIVITY #1

CHECK SHEET

Feature	Type of Public Transportation						
	Bus	*Train*	*Subway*	*Taxi*	*Ferry*	*Trolley**	*Carpool*
Convenience							
Hours							
Departure points							
Destination (stops)							
Safety							
Crime							
Traffic accidents							
Pollution							
Expense							
Absolute							
Relative to automobile							
Relative to other PT**							
Speed							
Frequency of runs							
Absolute travel speed							
Speed relative to car							
Speed relative to other PT**							
Comfort							
Seating							
Crowding							
Air conditioning/heat							
Privacy							
During rush hour							
Off-hour							
Social Benefits							
Energy use							
Air/noise pollution							

*Light Rail
**Public Transportation

SPIRIT MASTER #2: FOR USE WITH ACTIVITY #15

Case Study of a Proposed Public Transportation Improvement

Read the following case study and analyze it in terms of what kinds of opposition are likely to exist or develop against the proposed plan, why such opposition may arise, and how transportation planners and citizens who favor the improvement might counter such opposition.

Smithsville, U.S.A.--a typical city with a population of about 400,000 and a twice-daily traffic jam during the morning and evening rush hours. With the typical problems the poor, the elderly, and the handicapped face trying to get around the city. However, the Citizens for Better Transportation (CBT) has come up with a suggestion for improving the traffic problems of Smithsville. The CBT believes that if the city would provide special traffic lanes for buses on the major highways going in and out of the city during rush hours along with increased bus service during those times of the day, some of the rush hour problems could be solved. As part of its plan, the CBT would also like to see fares on all buses eliminated for the elderly; an additional 50 buses put into service; ten new bus routes developed to service the poor communities better; a tax on automobile parking lots in the city by which to pay for the buses and make up for the loss in revenues from free fares for the elderly; an increase of $5 per $1,000 in the excise tax on automobiles; and only carpools allowed to drive on the main highways leading into and out of the city during rush hour. Obviously, this plan is going to stir up a lot of opposition in Smithsville. However, the CBT is a persistent group that doesn't give up easily. It realizes it's going to have to plan its campaign very carefully if it is to succeed. It will have to

1. Decide what kinds of people and groups are likely to oppose its plan

2. Determine why these people or businesses or agencies will oppose it

3. Determine what it can do to overcome their opposition

4. Determine what allies it can expect to find among citizens, the government, politicians, and businesses.

What would *you* say are the answers the CBT came up with to each of these four questions?

SPIRIT MASTER #3: FOR USE WITH ACTIVITIES #27 AND #29

Sample Scenarios

Louis Spontini and his family live near a large city airport. Airplanes carrying cargo land at all hours of the night and make it difficult for him to sleep. A new group has just been formed to force the airport to shut down between 11 p.m. and 6 a.m. and Mr. Spontini is thinking of joining the group. However, business people in the city say that if the airport closes down during the night, many businesses won't be able to get their goods on time or in good condition. Trains, buses, and trucks either take too long or are too expensive. These business people say they might have to close down if the airport is closed at night. This would mean many people would lose their jobs.

Should Mr. Spontini fight to close the airport at night? Why?

Sophie Goldberg lives in a pleasant part of San Fernando, a large city with its share of traffic and parking problems. She has to fight every day, in fact, to get from her home to work a mile away. Then she has a problem finding a parking place when she gets home. For some time now, she has been reading about plans for building a freeway a mile from where she lives. This freeway would help people who want to drive into and out of the city from the suburbs. The proposed location would go through part of a beautiful old park near her home. In addition, she feels that the freeway will bring more cars into the city, create more parking problems and more air pollution. People who want the highway say that it will decrease travel time and cause less air pollution on local streets. City officials want the highway because it will encourage new industry to locate there and make it easier for people from the suburbs to shop in the downtown stores. The city needs the money from people from the suburbs in sales taxes and purchases. Without a freeway, these people will go to the local shopping centers rather than travel by slow routes into the city.

Should Ms. Goldberg oppose the highway? Why?

Robert Hernandez lives in Littleville, a small town about 40 miles from "the big city," North Neon. He likes his quiet countryside, free of air pollution and noise and lots of people. However, he has just learned from the newspaper that the state highway department, with Federal assistance, plans to build a part of Interstate 44 just one mile outside of Littleville. In order to locate the highway there, a bridge will have to be built over the best trout-fishing stream in the county. Most important, the exit at Littleville threatens to change the town from a quiet rural village to a big suburb. People who want the highway say that users will save time by having a fast route across the county and there will be fewer accidents than on the slower, windy roads people have to use now.

Should Robert Hernandez oppose or support the highway? Why?

Hilda LeClair lives on Pleasant Street, a two-lane suburban street lined with trees and houses. There are quite a few children and dogs in the neighborhood who play outdoors and run from one yard to another. Unfortunately, Pleasant Street is an easy connection between two main highways and huge trucks drive down the street from dinner-time until morning. The truck noise is disturbing and Hilda LeClair and her children are having difficulty sleeping. The trucks spray dirt on the house and they even make the house shake. When summer comes, it will be dangerous for the children to play outdoors after dinner. When Hilda called the office of the largest truck company to complain, she was told that the truckers need to use Pleasant Street because it saves time--and that saves money on the goods the truckers are carrying. Ms. LeClair is not satisfied with this result.

What should she do? Why?

The state of Liveitup is holding its annual hearings on whether to outlaw or restrict highway advertising. Ron Smith is uncertain about what to do at the hearings. Business people argue that the signs are necessary to attract tourists to the places of recreation and to provide them with information about what events are taking place, where to eat, and where to find hotels and motels. The tourist trade appears to reduce taxes on residents because of the money the tourists spend. In addition, the tourist business provides jobs for many people in the state. On the other hand, the signs sometimes cause accidents by distracting drivers from their driving tasks and, in addition, are an eyesore to many residents and tourists alike. Should Mr. Smith support a ban or restriction on roadside advertisements? Why?

SPIRIT MASTER #4: FOR USE WITH ACTIVITY #32

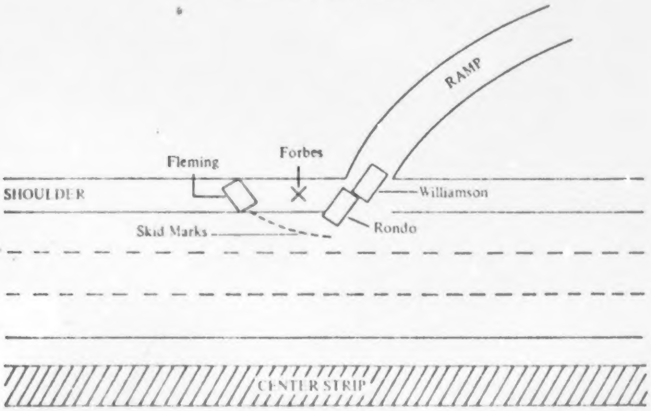
Fleming vs. Rondo--A Hearing

Below are five statements given in an automobile accident case--Fleming vs. Rondo. Ms. Fleming is suing Mr. Rondo for property damages. This complaint is being held before a hearing officer to determine if settlement can be reached out of court. Each person at the hearing is given the opportunity to tell his or her side of what happened in an attempt to arrive at a solution to the problem.

Hearing Officer: My name is Ms. Sussman. I am the hearing officer this afternoon. Present in the room are Ms. Fleming who has brought a suit for property damages against Mr. Rondo; Officer O'Connor who filled out the Police Accident Report in this case; and two witnesses, Mr. Forbes and Mr. Williamson. I am here to listen to you all. Each person will be given a chance to make a statement. No one should interrupt the other. I am not here to judge either party; I am here to help you reach a resolution and keep this case from going to the courts to save you time and money. Officer O'Connor, would you begin this hearing by making your statement?

Officer O'Connor (without emotion or inflection): I had come on duty the day of the accident at around 5:00. I hadn't been out on the road for more than 20 minutes when I got a call on my radio that there had been an accident on the highway near the Ocean View exit. Patrol cars in the area were to report there right away--traffic was all tied up. Let me use this accident report diagram to show you what I found when I got to the scene. One car--this one here--was up against the guardrail and two others were sitting in the road near the entrance ramp to the highway. The hitchhiker--who of course had moved from where he was standing at the time of the accident--was probably standing right about here in the road. Anyway, when I got to the scene, the cars were just like they are in the diagram. Several people were gathered around a woman who was sitting on the guardrail. I pulled my car over to the side and got out. I went over to the group of people and asked what had happened and if anyone were hurt. The woman's knee was bleeding, but other than that she and everyone else seemed all right. The woman's name was Sheila Fleming. She had been driving the car that was up against the guardrail. We measured her skid marks later--she had been driving between 45 and 50 mph at the time of the accident. The hitchhiker was a young kid named Jim Forbes--about 19 years old. The drivers of the other two cars were a Mr. Rondo and a Mr. Williamson. As far as we could find out, none of them had been involved in a serious accident before. That's about all I can tell you. All three cars were pretty badly damaged, though.

ACCIDENT REPORT DIAGRAM



Hearing Officer: Thank you, Officer O'Connor. Mr. Forbes, would you give your statement now?

Mr. Forbes (a little "spacey"): Well...I was hitching a ride on Route 44. I'm afraid I really didn't see too much of the accident because I wasn't paying much attention to the road. I tend to do a lot of daydreaming while I'm hitching rides--you have to or you can go bats while you're standing there waiting for somebody to pick you up. I didn't even see Ms. Fleming pulling over. The first thing I remember was hearing a horn blowing. I sort of "came to" then, just in time to see Ms. Fleming hit the guardrail right behind me and the other two cars crashing into each other. My heart was beating a mile a minute. I'm just glad I'm still alive! I could have been hit, you know. In fact, I could have been hurt pretty badly.

Hearing officer: Thank you, Mr. Forbes. Ms. Fleming, would you make your statement, please?

Ms. Fleming (trying to sound calm and firm): I was driving in the middle lane of Route 44. I wasn't too far away from Mr. Forbes--maybe a quarter of a mile, I'm not too sure exactly how far it was--when I noticed him standing near the entrance ramp hitching. He looked like a nice person, so I thought I would do him a favor and pick him up. I checked my rear view mirror and started to gradually change lanes so that I could stop to give him a ride. There was *no one* behind me when I started to pull over. *I am sure of that.* I am a very careful driver--I have never had an accident in my life. Just as I got into the other lane, a horn started blaring from somewhere behind me and I heard a squeal of brakes. (Becoming somewhat emotional) It was then that I lost control of the car and hit the guardrail.

Hearing officer: Mr. Rondo, may we now hear your side of the accident?

Mr. Rondo (somewhat defiantly): I was entering the highway by the entrance where Mr. Forbes was standing. I get on the highway by that ramp every evening of the week. I know it well. Every night I go about it in just the same way. I come down the ramp, cautiously come out on the highway on the shoulder, then squeeze into the flow of traffic. That's the only way to do it--otherwise you sit there forever, waiting until someone gives you a break. That night would have been just like any other if that hitchhiker hadn't been there. I had to pull out into traffic--if I hadn't, I would have hit that kid. And that lady had to be pulling over just then, too--she should have looked before she started to pull over. I know that road--I've driven it a million times--and I know you can see all the traffic on the entrance ramp from where that lady was. She should have seen me. She should have waited to pull over. Dumb...woman...

Hearing officer: Thank you, Mr. Rondo. And, Mr. Williamson, may we hear from you now?

Mr. Williamson (matter-of-factly): I was behind Mr. Rondo on the entrance ramp. Traffic was really heavy so we were all moving pretty slowly and everybody was pretty close to everybody else. But it's always like that at rush hour. If you're a good driver, nobody has accidents--you just got to be able to handle yourself and your car. Anyway, Mr. Rondo was just about to move out on the highway--in fact, I think he had just started to speed up a little--I remember that because I was thinking my car hadn't picked up like his since it was a week old. Nothing like a new car! (Pause) Well, anyway, I was just about to step on the accelerator when I heard this horn--I didn't even know it was that guy Rondo in front of me. I just slammed on my brakes and--whammo! What can I say?

SPIRIT MASTER #6: FOR USE WITH ACTIVITY #34

Sample Class Quiz on Drinking and Driving

1. Which of the following *least* affects the amount of alcohol in the bloodstream? (a) Stomach content; (b) Weight; (c) Drinking experience; (d) Time elapsed
2. Which of the following *best* describes the effects of alcohol on driver performance? (a) Blurs vision; (b) Reduces hearing ability; (c) Increases attention span; (d) Reduces ability to react quickly
3. When a nondrinking driver is compared with a drinking driver who has had three drinks, how much more likely is it that the drinking driver will become involved in a traffic accident? (a) No difference; (b) Ten times greater; (c) 25 times greater; (d) No one knows
4. On the basis of present-day knowledge, the greatest single driver-related cause of fatal highway collision is (a) Emotional upsets; (b) Inattention; (c) Fatigue; (d) Alcohol
5. What percentages of fatal traffic accidents involve alcohol use? (a) 1 percent; (b) 10 percent; (c) 50 percent; (d) Nearly all; (e) No one knows
6. Of all alcohol-related fatal car accidents, (a) Two-thirds involve problem drinkers; (b) Most involve social drinkers who had one too many; (c) Half involve people who had only a little to drink; (d) No one knows what kind of drinkers are involved.
7. Every day in the United States an average of approximately how many people are killed in car accidents in which alcohol was involved? (a) Three; (b) Ten; (c) 75; (d) 200; (e) No one knows
8. Police know that two-thirds of the alcohol-related traffic fatalities are caused by problem drinkers because of all of the following *except* (a) Their very high blood alcohol levels; (b) Their previous record of offenses; (c) Their record of alcohol problems; (d) Their very high speed rate just before the accident
9. The social drinker-driver is dangerous because (a) Of sheer numbers; (b) They are not easy to spot and defend against; (c) They fail to recognize their limitations; (d) All of these
10. Problems drinkers who drive usually have (a) Serious health problems; (b) Other personal problems; (c) Low intelligence; (d) A record as law-abiding citizens
11. Which of the following is *most* affected by heavy drinking? (a) Brake reaction time; (b) Color perception; (c) The reasoning process; (d) Distance judgement
12. Excessive drinking may have which of the following dangerous effects on a driver? (a) Overconfidence; (b) Risk-taking desires; (c) Decreased judgement; (d) Increased reaction time; (e) Lack of concentration; (f) (c) and (d); (g) (c), (d), and (e); (h) All of the above
13. Since we know that two-thirds of all alcohol-related traffic fatalities are associated with problem drinkers, (a) We should ignore social drinkers who drink and then drive; (b) Problem drinkers should be a major focus of efforts to reduce drinking-driving accidents; (c) Drivers should feel free to have a couple of drinks before driving; (d) All of the above
14. Teenagers are more likely to have difficulty driving safely after drinking because of all of the following *except* (a) Driving is a new and complicated skill for them; (b) They have had less experience with alcohol's effects; (c) They often weigh less than adults; (d) They spend more time driving than adults do.

SPIRIT MASTER #7: FOR USE WITH ACTIVITY #41

Observation Sheet

Location:

Time of day:

Traffic conditions:

Description of pedestrian facilities (e.g., crosswalks, lights, signals, signs, overhead walks--a map may be drawn if desired):

Characteristics	*Pedestrian Type:*			
	Young Child	*Teenager*	*Adult*	*Elderly*
Handicapped				
Male				
Female				
Crossed street correctly				
Ran				
Crossed other than at intersection or crosswalk				
Not paying attention				
Crossed against light				
Caught in middle of street				
Standing in street waiting to cross				
Other:				
Other:				

Observation Sheet may be filled with check marks, hatch marks, etc.

SPIRIT MASTER #8: FOR USE WITH ACTIVITY #52

Purchase Considerations

Potential bicycle purchasers can base their selection upon their riding proficiency, the intended use of the bicycle, the amount of use anticipated, the presence or absence of safety features, the ease of use, good workmanship, and the availability of replacement parts and repair service. The following checklist may be of help.

Item	*Brand*			
	A	*B*	*C*	*D*
Frame styles				
Lightweight				
Medium weight				
Heavy duty				
Folding				
Girls/boys				
Frame size				
Handlebar types				
Drop style				
High rise				
Tourist				
Brakes				
Caliper, front				
Caliper, rear				
Caliper, front/rear				
Coaster				
Seat styles				
Banana				
Bucket				
Racer				
Mattress				
Touring				
Pedal styles				
Flat				
Trap				
Gears/ratios				
Constant				
Shifting				
3-speed				
5-speed				
10-speed				
15-speed				
Wheel sizes				
Front				
Rear				
Tire types				
Thinwall/racer				
Touring				
Tractor				
Slicks				
Fenders				
Full				
Partial				
None				
Weight/total				
Special equipment options				

Text and chart adapted from *Bicycle Safety Curriculum Guide* (University of the State of New York, State Education Department, Division of General Education).

SPIRIT MASTER #9: FOR USE WITH ACTIVITY #56

Bicycle Inspection Check Chart[a]

Item Inspected	*Lubricate*	*Tighten*	*Adjust*	*Repair/ Replace*	*Approved*
Frame tubes	▨	▨	▨		
Fork blades true	▨	▨	▨		
Handlebar tight	▨				
Extension tight	▨				
Grips tight	▨				
Bar height, angle	▨				
Saddle height, angle	▨				
Seat post	▨				
Fit, bicycle	▨				
Steering head					
Crank bearings					
Cranks, cotters	▨		▨		
Drive sprocket	▨		▨		
Driven sprocket	▨				
Chain					
Pedals (complete)	▨		▨		
Pedal bearings		▨			
Mudguards, braces	▨				
Carriers	▨				
Cleanliness 100%	▨	▨			
Wheel nuts--F & R	▨		▨		
Wheel bearings		▨			
Hub, rear bearings		▨			
Brake operation					
Tire condition--F & R	▨				
Rims--Front & Rear	▨	▨			
Spokes--Front & Rear	▨				
Tire inflation	▨	▨		▨	
Hand brakes					
Brake & gear cables					
Brake & gear levers					
Gear shifter					
Speedometer					
Generator (batteries)					
Headlight	▨				
Tail light	▨				
Reflector	▨				
Signal Device	▨				

[a] From *Bicycle Safety Tests*, Bicycle Institute of America, New York, page 8.